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EDMUND RUFFIN, EDITOR AND PROPRIETOR.—T. W. WHITE, PRINTER.

For the Farmers' Register.

CONCISE DIRECTIONS FOR THE CULTIVATION AND MANAGEMENT OF TOBACCO.

I. Raising Plants.

The land selected for the plant bed should be grubbed, and the stumps of large trees cut very low. When the land is dry, and in fit condition to burn, it should be raked, and all litter carefully removed. The fires should then be raised in the usual way, and after they have been properly kindled, should remain on the spot about one hour, and then be removed; continuing the operation in the same manner, until the whole bed is burnt. The bed is then broken up with hoes, and sometimes with coulters drawn by horses or oxen, and the work repeated until the earth is made perfectly fine, being careful to avoid turning under the surface. All the roots should then be extracted, and the land laid off in beds (slightly elevated if dry, and more if moist or wet) four feet wide. And to sixteen square yards, a common pipe bowl of seed is sown. The bed is then trodden or pressed with hoes, and well covered with brush. When the plants have come fully out, they should be slightly manured with strong manure made fine; this should be repeated frequently, and in larger quantity, as the plants increase in size, and are able to bear it.

II. Preparation and Planting.

Old land, or land that has been cultivated, after it has been repeatedly ploughed and made fine, is thrown into horizontal beds four feet wide; and when ready for planting, a hand should be selected, prepared with a measure three feet long, which is to be his guide in stepping off the beds. With a little attention, and measuring occasionally, he can soon be accurate in the length of his step, which should be three feet. The hoe hands follow on, and at each track, or foot print, a deep and thorough chopping is made, so that the space for the reception of the plant is deep and fine. The plant is then inserted, and a mark descending from the plant to the water furrow, is made with the planting stick, at the time of planting. The object of this mark, is to drain off the water, and prevent the soil from running together and becoming hard about the plant by hasty rains, which is sometimes very injurious. There is some diversity of opinion, whether beds as a preparation for planting are preferable to hills: I am decidedly in favor of beds. On high land, half the amount of labor usually devoted to the hill, if bestowed on the bed, will make a much finer and softer situation for the plant. In making hills, much labor is lost; the top of the hill, after being made up, must be cut off or dragged down, before planting. In preparing the bed, every lick counts: all the labor is condensed, and confined to the space for the reception of the plant. Beds retain moisture longer than hills, being not so much exposed to the action of the sun and winds, and this is of great consequence, especially when the plant is drooping and weak, from transplanting.

III. Cultivation.

It is important in the early growth of the plant to plough and work deep once or twice, so that when it is ripening, the ground will be broken deep and fine. (The coulter is preferred for this operation.) This should be effected without much interference with the roots, as that would check the growth, and prevent the plant from attaining its proper size. And hence, the advantage of greater distance between the rows, than the common distance of three and a half feet—because the wide rows can be ploughed, and worked with less damage to the roots. In this, as in all other crops, if we wish a good return, "we must speed the plough" and hoe, before the roots run out. On our high lands, we should endeavor by deep and horizontal ploughing, to counteract the bad effects of drought. On our flats, we should aim to prevent the collection of water by drains discharged at the lowest point.

The bed is best for high land, because it retains more moisture where it is generally needed. The hill, retaining less moisture, is best for flat land, where there is commonly a superabundance.

IV. Priming and Topping.

The most accurate topping is performed by measure. The topper carries in his hand, a measure six inches long, and by occasionally measuring, he can regulate the priming with great accuracy—and as the remaining leaves are numbered, this governs the operation, and gains the object of even topping. The topper should always carry this measure in his hand, as it serves to prevent excuses for negligence and uneven topping. Prime six inches, and top to eight leaves. We have found by experience, that this is the best average height. We sometimes, but seldom, vary from this general rule. If the land is poorer than common, or if from the backwardness of the plant, and the advanced state of the season, we apprehend frost, we do not prime as high; (say four inches.) If we have an uncommonly rich spot, and there is danger that the top leaves will come to the ground, we should rise in the same proportion. The crop should be wormed and suckered, at least once a week.

V. Cutting and Housing.

When the crop is perfectly ripe and ready for the knife, when the plants are well matured (which state we cannot describe, but must leave to the experience and observation of the planter,) we then approach the most difficult and delicate part of the whole operation; and the successful planter must now be all attention. The profit of the whole farm, for the year, greatly depends on the diligence and skill, exercised in the few days of cutting and curing. We should therefore prepare well for this state of the crop, by having our barns close, our carts and wagons in good order, so that the work may be made as light as possible; for this is hard work, to make the best of it. To save a heavy crop in the best manner, requires both energy and activity. The most judicious hands should be

selected for cutters. When in the field, a middling or average hand should count the whole number of plants he cuts, so that allowing each cutter the same number, we may arrive at nearly the whole quantity cut. We should never cut more nor less than will fill the contemplated barn; otherwise there is labor lost in attending to a barn not full, or the overplus is injured for want of firing. The tobacco, after it has "fallen," or become sufficiently limber, is carried to the barn in carts or wagons, hung from six to ten plants on a stick, and stowed away for firing. It is also of great importance to be particular in the arrangement of the sticks. The equal and general circulation of heat throughout the house, depends on the manner in which this is done. Our barns commonly have three firing tiers above, and three below the joists. We commence arranging the sticks on the most elevated tier in the roof, to which we give five inches distance; and on each tier, as we descend, we gain one inch; so that on the lowest tier, nearest the fire, the sticks are placed eleven inches apart. This disposition of the sticks, I have ascertained by late experiment, is important. The sticks of tobacco being wider apart, next to the fires, gives a freer circulation, and consequently, a more equal temperature, than the usual way of equal distance from bottom to top. The heat having more space to ascend, must be more equal and generally diffused, and will give a more uniform house of tobacco. I esteem this a considerable improvement; and if we have house room, and make a greater difference in the proportionate distance between the sticks, it will be a still better arrangement.

VI. Process of Curing.

We commence our warming, or preparing fires, the day after housing. We prefer what is commonly called the "bed logs" of green, and the "feeding" of dry or seasoned wood. By this arrangement, the fires are rendered more governable. The bed logs, should be nicely fitted to the barn floor, two lengths to reach across, the large ends placed outwards, to guard against the tendency of heat to the centre. We keep up our warming fires, from 36 to 48 hours, the mercury ranging from 100 to 115 degrees. This will generally bring the leaf to the drying state; the tail, or end of the leaf, now begins handsomely to curl, *and then the planter must be wide awake.* If he is careless, and his fires are made too hot, the aromatic oil passes off with the sap and smoke, and he has a red or dark inferior house of tobacco. If his fires are kept too low, his tobacco gets into a clammy sweat, and the oil escapes. There is much more danger of the former, than of the latter evil. There is more tobacco injured by too much heat, than by the want of a sufficiency. The fires should now be kept steady and regular, with a gradual increase of heat, so that in 48 hours, the mercury will stand 150 to 160 degrees. It must be kept at or about that temperature, until the tobacco is cured.

VII. Stripping and Prizing.

The tobacco should be taken down and packed in bulks, in high order, that it may be handled in cold weather without breaking. It is then divided, by select hands, into three classes, for stripping—1st. That which is of the best color and quality—2ndly. That which is somewhat inferior, comprising the balance of the leaf—3dly. Lugs, or ground leaves. Some distinguished planters make more classes, but this requires more attention and discrimination, and our laborers generally, are not noted for either. It is then sized, and neatly tied in bundles of four leaves of the first, or six of the 2nd and 3rd classes. At the close of each day's stripping, and oftener, if the weather is drying, we bulk down what has been stripped, being careful to pack straight. It is left in this situation, until we wish to commence prizing, and then hung, from twelve to fifteen bundles on a smooth stick, and hoisted in the barn, the sticks placed six inches apart, the hoister carrying a measure in his hand. It is important to measure, as the order will be more uniform. It should remain until the stems are perfectly dry; after which, it should be taken down for prizing, as dry as it can be handled, without breaking. It remains in this state a few days, until the leaves are pressed together, and we have soft weather for packing. Each bundle is then carefully straightened, repacked, and heavily weighted. It is then ready for prizing. We should prize in weather when the order of the tobacco will not change. Each bundle should be straight, and closely packed in hogsheads, in the usual way.

Remarks.—The preceding account is submitted with diffidence—not for want of confidence in the principles, but because the subject has been delineated by an unpractised pen. The hints presented, may, if perseveringly and attentively followed, prove advantageous. They have resulted from ten or twelve years of (I may add not unsuccessful) practice. In order to avoid prolixity, I have perhaps erred on the other extreme. If so, and any alteration from old customs should need the support of an argument, I will be pleased at any time to give the reasons operating and causing the change. I have not attempted to give reasons for each particular item in detail, because it would have defeated the design of brevity, which I think is indispensable in communications of this kind. I have not used the thermometer more than four or five years, but have found the temperatures mentioned in the account, to coincide with my general practice.

J. F. EDMUNDS.

Mecklenburg, Feb. 26th, 1834.

QUERIES AS TO TOBACCO ON OATS.

To the Editor of the Farmers' Register.

North Carolina, March 15th, 1834.

I noticed in a recent number of your publication, "a plan for the culture of tobacco on the two shift principle, succeeded by oats, to be fallowed, or rolled, as may be thought best." This is a most important discovery, and will prove eminently beneficial to this section of country, where tobacco is the principal market crop, and our lands are nearly exhausted by continued cultivation. This, combined with Mr. Bruce's excellent plan of *horizontal trenching*, will attract the attention of enlightened agriculturists, who, it is hoped, will favor the public with their views and experiments. Information is wanted: you have, in your valuable Journal, given us much, and will doubtless give us more. A planter in this section selects some eligible spot, and puts upon it, his modicum of manure. This spot is annually cultivated; in a few years, the remainder of the plantation, presents a

scene of poverty. Old fields, galled hill-sides and gullies, constitute his estate. To us improvement is a matter of absolute necessity; we must fertilize our lands, or abandon our homes. It was not my purpose to apprize you of our wretched system of agriculture, but to obtain from you, or your intelligent correspondent, information as to the proper time of fallowing oats, &c. At what period of the year will the earth receive most nutriment from fallowing oats? Do the seed or straw impart most strength to the land? Will not rye answer the end of oats? Or do oats contain a property peculiarly propitious to the growth of tobacco? Will land possessing fertility sufficient to bear, and receiving the benefit therefrom, produce tobacco? I hope your correspondent will not content himself with a simple response to my interrogatories, but will furnish you with his system of cultivating tobacco. I contemplate making an experiment with cotton seed and swamp mud, and will acquaint you with the result. Accept my best wishes.

A PLANTER.

DEVON AND DURHAM CATTLE.

To the Editor of the Farmers' Register.

Buckingham County, Feb. 11, 1834.

As the improvement of our cattle is of much importance to the agriculturist, and having lately seen a most beautiful cow and calf, of the North Devon breed, I thought it would be gratifying to you, to bring them to the notice of the public, through your useful paper.

This cow is owned by Richard G. Morriss, Esq. of Buckingham county, who purchased her last spring, from Henry Thompson, Esq. of Baltimore. Although she is only two years and eight months old, she has a fine calf, upwards of three months old, by her side, both of them of a mahogany red; and for perfect symmetry of form, I have never seen any animals that surpass them.

This breed of cattle is remarkable for hardiness, and is said to make the best work oxen.

The cows give large quantities of rich milk, and although not as large as the Durhams or Herefords, yet of sufficient size and early growth, for a farming community. I have seen well authenticated accounts in the American Farmer, of bulls under three years old, weighing from 1300 to 1400 lbs. The owner informed me, that both cow and calf, are of genuine North Devon blood, being a cross from the importations of Henry Thompson, with a descendant from those sent as a present from Mr. Coke of England, to Mr. Patterson of Baltimore.

This gentleman, has also a very fine bull of the Devon and Alderney breeds.

There is also in this county, a noble looking bull, belonging to Col. Thomas M. Bondurant, which he purchased at Mr. Meade's sale, of Frederick. This bull's sire, was a full blooded Durham, and his mother supposed to be a Hereford; he is of fine form, and the largest bull of his age, I have ever seen.

As our citizens have given over to a considerable extent, the culture of tobacco, and are turning their attention more to wheat crops, and improving their lands with clover, blooded cattle will be found to be a considerable auxiliary: and if the advantages of having blooded stock, be duly appreciated, those individuals will be amply repaid for the considerable expense they have been at, in introducing them among us—which is the wish of

A BUCKINGHAM FARMER.

DRAINING AND CULTIVATING LOWGROUNDS.

To the Editor of the Farmers' Register.

The piece of lowland, which furnishes the subject of the following observations, is the bottom of what formerly was an old *Beaver pond*, on the Birchen creek, and containing from twenty-five to thirty acres.

The land is very fertile, with a soil from two to three feet deep, of a chocolate color, and oily appearance. No timber is on it. Several species of grass, interspersed with shrubs, are its natural growth, affording in the winter season, plenty of wild duck and muskrats for the sportsman; in the spring, early grass, to bring trouble and loss to the herdsman; in summer, swarms of moschettoes to disturb our children; and in the autumnal season, it produces the *miasmata* of bilious fevers.

The main ditch is on the south side of the flat, ten feet wide, and three feet deep, (which is almost deep enough for any ditch having sufficient fall,) with its bank thrown towards the land drained, leaving sufficient space for the water to pass in our largest freshets, by which the bank is protected, and the reclaimed land rendered secure. The streams and springs which flow into the bottom from the hills on the north side, are intercepted and carried off, by two smaller ones; one of which crosses at the upper, and the other along the lower edge of the land. The latter, which conveys a considerable land stream, is four feet wide, and three deep. The upper side ditch is two feet wide, and two deep. Besides these, there are two small ditches, running north and south, (dividing the land into three parts, not far from equal in width,) and these are intersected at right angles, by another passing east and west through the middle of the land, and opening into the upper side ditch. These interior ditches are two feet wide, and two deep; and all serve to draw the surface water from the land, and from the side ditches, and convey it into another ditch, running along the north side of the lower part of the bank, and thence into the main ditch at the lowest extremity. The interior ditches all open into each other—but not into the main, or the side ditches, except at the lowest point, where the water is all discharged.

No bank to these inside draining ditches is necessary, as we should plant and cultivate to their very *margin*, to prevent the growth of weeds, &c. which will most certainly fill up the little ditches, if suffered to grow. This piece of ground, I intend to plant in corn this year. The manner of preparing it, the width of the corn rows, the distance of the corn hills from each other, and the nett proceeds of the crop, shall be the subject of a separate and distinct *communication*, if no unforeseen occurrence happen. Experience has taught me, that every farmer and planter, should as soon as possible, make himself well acquainted with the nature and quality of his land, that he may know to what *kind of produce* it is best adapted. Ten years' observation has taught me, that land immediately on small streams, such as branches and creeks, which require ditching to render them arable, will be much more productive and profitable

in corn and oats, than in tobacco and wheat. I have made the experiment, I think fairly, and am therefore justifiable in making the assertion. It is true, that the soil on those streams is very rich, yet the different *strata* are very porous, and composed of much sand, often called, and very correctly too, the "washing of the hill sides."

Attending the tobacco crop, there are too many injuries for me ever to think of cultivating it again on lowgrounds. It is more subject to injury than high land. In wet weather, it is more apt to *spot*. In very dry weather, the scorching sun will *burn* its leaves, unless it is cut green; and it not unfrequently happens, that a freshet (like a hurricane) comes and sweeps it all away; if not, it leaves *a muddy glue* on the leaves of the tobacco, which will ever defy the skill and industry of the factories to make clean. Added to this, I may say, provided the year is suitable to its growing, the tobacco generally becomes too *large and coarse*, to bring high prices.

My objections to the wheat crop on this kind of land, may be very readily made. The land in the first place, is generally too *light*. The exuberant weeds and grass which come forth after "laying by" the corn, renders it almost impossible without double labor, to get the corn off, and fallow in beds, before it will be too late in the year to seed wheat. Unless it is seeded early, and put in pretty deep, it is almost certain to be seriously injured, if the winter is either very wet, or very cold. I have also discovered, that the wheat is much more subject to the disease called the *rust*, than on high land.

To corn and oats, this kind of land seems particularly well adapted. I seeded eighteen bushels of oats, in 1832, on a piece of lowground, which was the preceding year, (1831,) in fifty thousand tobacco hills; or more learnedly speaking, from ten to twelve acres. It made me ten stacks about the same size each. Three of the stacks, I cleaned out for seed. They measured about one hundred and twenty bushels; making from the eighteen, about four hundred bushels. Of the oat crop, I am particularly fond, more especially when there is a prospect of corn selling high, the ensuing summer. From *necessity*, I have very satisfactorily learned, that it is an excellent substitute for both corn and fodder, in feeding to horses, even working horses. Since I have quit making tobacco on lowland, I have been no corn *buyer*. Since I have fallen out so much with the tobacco and wheat crop on this kind of ground, it may be asked, have I abandoned *in toto* the making them? I answer no. I am making more, and of better quality. All of the manure, I can raise from my stables, corn stalks, &c. is carried to my two lots, which are enlarged, or *diminished*, according to the quantity of manure I can raise. They are made rich, and are alternately put in tobacco and wheat. In the month of August, and the early part of September, I fallow high ground to add to my tobacco lot, for wheat; by which I can always have enough wheat land for my hands.

Too much care and attention, for the farmer's interest, cannot be paid to such land as has undergone the system of draining. All those who have paid much attention to ditching, and have had much of it done, very well know the great expense necessarily incurred; and unless there is a sufficient fall, it is perfectly useless to attempt it, to any great extent. The little draining ditches are also indispensably necessary; otherwise the land will always be too much "sobbed" (or saturated with water) particularly in the winter season, and early in the spring, when the plough should be preparing it for the expected crop. Land ploughed in such a state never produces enough to compensate for half the trouble and expense of cultivation. The clods thus turned up by the plough in March and April, soon become of a consistence, (comparatively speaking) as hard as brick bats, which roll to and fro during the whole ploughing process, making the horses stumble and the ploughmen limp. But to the point. Our ditches should be watched with *a parent's care*. The banks should be kept clean of weeds, briers, &c. This can be very easily done, by planting pumpkin seed on their sides. Not as much work is required to make this valuable vegetable, as there is time and labor necessary in gathering and hauling them home. This kind of ground produces them in great abundance. The benefit that milch cows and hogs receive from them, need no description from me. I understand horses can be made very fond of them. I have no doubt of it, although I have never tried them for horses.

Every obstruction that is thrown in our ditches, the larger ones in particular, should be removed without delay; otherwise *rafts* will form therein, obstructing the free passage of water; thereby filling up the ditches, and causing an overflowing and breaking of their banks, every freshet. *Overseers and negroes would as soon make a raft, as to take one away;* therefore, it is the bounden duty of the *master*, to visit his ditches soon after much rain.

I may have said more about lowgrounds and ditches, than many may think necessary; but the distant reader is informed, and well assured, that this section of Virginia *requires*, that all of her creeks, branches, marshes and quagmires, should be ditched and drained, and the land thereon, and therein, made arable; if not, the deep red gullies, and the barren fields, which our forefathers left us as a legacy, will most assuredly, either make us real *paupers*, or *deserters* of our native state. For the red gullies, we have *a remedy*. For the worn out fields, we have *a specific*. Doctor Farmers' Register, will prove a good physician. We should *theorize* with him of nights, and *practice* on our farms in the day. *Industry, untiring perseverance and good judgment, are necessary auxiliaries. We should rise in the morning on industry, travel through the day with steadiness, prudence and perseverance, and sleep at night on sobriety and a goodly portion of judgment.*

P. W. HARPER.

Greenfield, Nottoway County,
February 20th, 1834.

MISCHIEF ARISING FROM THE SPARKS OF LOCOMOTIVE ENGINES.

It appears, from the December number of the Journal of the Franklin Institute, that Mr. James P. Espy, of Philadelphia, has obtained a patent for an improvement in the chimney cap, for increasing the draft in the furnaces of steamboats and locomotive engines, which, upon trial, has proved entirely effective. Mr. William Knight, civil engineer, asserts, "that it completely answers the purpose of stopping the sparks, without diminishing the draft.

It may be hoped, therefore, that every steam engine in use, within the United States, will be immediately furnished with one of these caps.

For the Farmers' Register.

ON THE MANUFACTURE OF POTASH.

[It is remarkable that the manufacture of potash, which has formed so considerable and profitable an employment for the industry of the northern states, has never been in operation in Virginia. Of course, no satisfactory answer to the following letter of inquiry on this subject was to be obtained at home—and it was therefore sent to a gentleman who resides in Cayuga county, New York, whose location, as well as his general information, it was inferred, would enable him to give the statements required. He has kindly complied with the request, by sending the communication inserted below. We also add the article on this manufacture in Rees' Cyclopædia.]

Tothe Editor of the Farmers' Register.

The enormous waste of wood throughout Virginia and the southern states, induces me to inquire whether a considerable saving to the country may not be effected, by converting a portion of it into potashes, and by preparing the bark of certain descriptions of trees, for tanning and dyeing.

In clearing our lands, it is the practice to burn all the wood which is not used for fence rails, and no care is taken of the ashes. It is well known that from the branches and twigs of oak, a larger quantity of potash is obtained, than from the same weight of the trunk of the tree, and that the branches are entirely lost with us in clearing land.

Now, my object in addressing you, is to request that you will obtain and publish the most simple and clear directions for making and preparing potashes for market, embracing the cost of all requisite apparatus, labor, &c. and the quantity produced from a given weight or measure of white oak, red oak, and other woods common to our country. The preparation of bark for exportation might also be valuable, if the mode of doing it was made known to our farmers. QUERIST.

To the Editor of the Farmers' Register.

William Culver, Esq. from whom the following particulars were obtained, has been concerned in the manufacture of potash for many years.

It is estimated that 450 bushels of good *house ashes* will make a ton of potash. Some skilful workmen can produce more. The manager of his works contracted to make a ton from every 425 bushels; and he has even made that quantity from 420 bushels; but it is more than common workmen can produce.

Of *field ashes* about 550 bushels are required to make a ton. This difference is owing to impurities, and to a want of compactness in the ashes. Great care should be used in scraping them up, so as to exclude as much dirt as possible. It requires more care to work them.

At this time, house ashes are worth 10 cents a bushel at the ashery; and field ashes, 7 cents.

One man can manage an ashery, consisting of the different vessels hereafter to be mentioned. There ought to be 6 leaches (or leach tubs) each 10 feet long, constructed in the following manner: Lay two parallel sills, *one a little higher than the other*. On these *the bottom* of the leaches are laid—made of boards 4 feet long, not grooved and tongued, but *breaking joints*. These should be a foot high from the ground, so as to admit a trough under the lower edge to catch the ley, and to lead it into the ley tub, which may be a half hogshead sunk in the ground, and which will serve for *two* leaches.

The boards, 4 feet in length, which constitute the sides of the leach, are held together by two rectangular frames; the lower one resting on the bottom is 18 inches wide, and the upper, near the top of the leach, $3\frac{1}{2}$ feet wide.

On the bottom of the leach, lay small sticks crossing each other, to the height of two inches, for the purpose of letting the ley run off freely. On these, place straw, to be 4 inches thick when well pressed down, to prevent the ashes from washing through, and mixing with the ley. Three bushels of lime to each leach, are spread on the straw: its effect is to facilitate the melting of the potash. Every *third* time that the leaches are filled, new lime is to be applied after ejecting the old.

The ashes when thrown into the leaches, must be made compact by pounding it down. In this way a leach will hold 60 bushels.

The leaches are worked in pairs. One pair may be *running* while the second is *soaking*, and the third is being *emptied* of old ashes, or being *filled* with new. This arrangement prevents the workman from losing time by waiting, or from being too much hurried at another time.

Two potash kettles of 90 gallons each, are wanted for boilers, and may cost about $35 a piece. These are set in arches. Several sugar kettles, containing about 20 gallons each, will also be wanted for *coolers*.

The manufacture of potash is generally commenced in the spring, when there is no longer any danger from freezing.

Ley, too weak to bear an egg, is not put into the boilers, but is used for wetting such leaches as have not begun to run.

During the boiling, a *dipping pan* is placed in each boiler, resting on the bottom, to catch the *black salts* as they settle; and when the pan is full, it is emptied from time to time. By this process, the ley will not become so thick, and consequently evaporate faster.

When the strong ley (such as will bear an egg) from the *two* leaches, is all poured into the boilers, then increase the fire. For this purpose, *good dry wood is necessary*. The black salts are now to be *returned* to the boilers; and there will be a danger of the liquid running over. This is prevented by dipping it up and pouring it back into the boiler. Repeat it till this disposition to rise over shall disappear. Then raise the heat still more till the potash is perfectly *melted*, and becomes almost as thin as water. It is then to be dipped out into the coolers, *being careful to have them* VERY DRY. Let the potash stand till next day—it will crack into four quarters. Turn it out, and it is fit to barrel.

My informant suggests there would be a great advantage in having some person to start the works who was well acquainted with the business.

D. T.

Article on Carbonate of Potash in Rees' Encyclopædia.

The potash of commerce, or black potash, as it is also called, is universally procured from the combustion of wood; and therefore its preparation can

only be undertaken with success in those uncleared countries where are vast natural forests, and where, from the imperfection or distance of transportation, the value of timber is no more than that of the labor required to fell it. The only districts in Europe in which any considerable quantity of potash is made, are the mountainous forests in Germany, and the extensive woodland tracts of Poland and Russia. The British market is principally supplied from the United States, a country in which, from its rapid increase of population, there is a constant demand for cleared land, for the purpose of agriculture; and therefore, where timber is looked upon rather as an incumbrance than as contributing either to the beauty or the value of the ground on which it stands.

The American method is, to pile up the wood, as soon as it is sufficiently dry to burn, in large heaps, and reduce it as quickly as possible to ashes: these ashes are then put into a wooden cistern, with a plug at the bottom of one of its sides, and a quantity of water, sufficient to make a strong lixirium, is added. After standing for an hour or two, the plug is withdrawn, and the water holding the potash in solution, runs out, leaving the earthy parts till impregnated with a portion of alkali in the cistern. This solution is then evaporated to dryness in iron pans, and hastily fused into compact reddish brown masses of semi-caustic potash, in which state it is fit for market.

In Germany, where the value of wood is greater, care is taken to select such kinds as are the richest in potash; the combustion is slower, and of course the temperature lower, in consequence of which, but little is lost by volatization; the lixiviations also of the ashes are judiciously repeated till the alkali is extracted.

Proportion of potash afforded by 100 parts of wood of different species, which being previously dried, were burned by an open fire, to ashes; and which, after being weighed, were lixiviated till all their saline contents were extracted.

	Ashes.	Salt.	Salt from 100 parts of ashes.	
Oak,	1. 3	0.15	11.1	*Academy of Sciences, at Paris.*
Beach,	0.58	0.12	21.9	
Aspen,	1.22	0.07	6.1	
Fir,	0.34	0.04	13.2	

To the Editor of the Farmers' Register.

The paper which I send herewith is copied from "The Journal of the Franklin Institute," a periodical published in Philapelphia, devoted especially to the mechanic arts, manufactures, and general science; the subject of it being one which I thought peculiarly appropriate to the pages of a publication like the one you are engaged in conducting: and having first appeared in another, which, though I believe it is very extensively circulated, yet but little, if at all, amongst the readers of the Register, I determined to hand it to you, that if you deemed it of sufficient interest, you might give it a place in your columns. It is chiefly on account of the information given in the first part of it, that I thought it might be useful. The remarks on the subject of the machine, which the writer had heard was invented by some person at the south, for hulling cotton seed, are perhaps to be accounted for, from the want of information. If he had, as the writer of this has frequently enjoyed, opportunities of witnessing the successful operation of the machine alluded to, no doubt, they would have been of a different character.*

If any additional inducements are needed by our agriculturists to turn their attention more to the culture of seeds from which vegetable oils are manufactured, they may be found in the fact that establishments for the purpose of manufacturing that article are multiplying in this part of our state; a circumstance that will at all times insure sufficient market, and competition in that market.

That your very useful Register may be supported more extensively than heretofore, you have my hearty wishes. Yours, &c.

HUGH NELSON.

Petersburg, March 6, 1834.

REMARKS ON THE CULTURE OF SEEDS FOR, AND THE MANUFACTURE OF VEGETABLE OILS. *By Charles V. Hagner, Manayunk, Philadelphia County.*

I was much pleased to find in the Journal of the Franklin Institute for November, an essay containing some useful hints on the subject of the manufacture of vegetable oils. I have long been astonished that a subject of so much importance to the agricultural, manufacturing, and commercial interests of our country, should be so long neglected, and that more attention has not been paid to it. I am perfectly convinced that there are many seeds from which oil for various purposes could be produced, and which could be grown with great advantage to the agriculturist. All that is necessary, is to draw his attention to the subject, and induce him to make the experiment. It is but a few years since the palma christi, (castor bean,) was first grown in quantities in this country, yet the introduction of it here has had the effect, as almost every one knows, of improving infinitely the quality of the oil, and of supplying the market at from two to three hundred per cent. cheaper than was paid for the nauseous and miserable stuff, formerly received from the West Indies and elsewhere.

One of the seeds mentioned by your correspondent, colchicum or rape seed, is of the greatest importance, and produces an oil which is, and has long been, much wanted for manufacturing purposes. This seed is grown abundantly in all parts of Europe, and the oil made from it is extensively used in the process of manufacturing cloth: it is, I believe, the cheapest oil they have, and takes the place of common kinds of olive oil, which the manufacturers of this country are obliged to use at a great cost. This is a matter of great importance, when it is known that to every 100 pounds of wool carded, there is consumed from two to three gallons of oil. The rape seed oil is so cheap and abundant in Germany, that it is much used in adulterating linseed oil; hence the bad quality of some of the German paint oils, as the rape seed oil does not possess the drying qualities of that

* Our correspondent alludes to the machine for hulling cotton seed, invented by Francis Follett, Esq. of Petersburg, Va. which is in operation there, and in various other places. There remains no doubt of the perfectly successful operation of this machine in removing the hulls from the kernels of the seed, and thus enabling the oil to be expressed with as little difficulty as from any other vegetable substance.—*Ed. Farm. Reg.*

from flax seed, and is therefore unfit for the purposes of painting, &c.

Having been for a long time engaged in the manufacture of flax seed oil, and having made various experiments on other seeds, I have, of course, had some experience on the subject. In relation to rape seed, I had an excellent opportunity of making full and satisfactory experiments. In the year 1822 or 1823, an English gentleman, who was familiar with the culture of rape seed, and who had a farm somewhere in the neighborhood of Salem, N. J. brought to my establishment about forty bushels of rape seed, which he had produced upon his farm. The account he gave me of its culture was this. Two acres were sown with this seed (broad cast) in the month of August; it sprouted, and was growing very handsomely, but late in the fall, the cattle broke into it, and as he thought, completely destroyed it. He abandoned the experiment, and suffered his cattle to roam in it all winter; but in the spring, observing it sprouting again, he put up the fence, and as he expressed himself, "let it take its chance." The two acres with this, as he considered it, unfair experiment, produced him about forty four bushels of seed, for which I offered him four dollars per bushel, which he refused to take. I expressed it for him; and although my apparatus was not by any means perfectly adapted to the purpose, the manufacture differing in some respects, not necessary to state, from that of flax seed oil, I produced three and a half gallons of oil per bushel. The cake, that is, the pulp after the oil is expressed from it, he valued highly for fattening cattle, and refused to take seventy five cents per bushel for it; the oil he sold to a woollen manufacturer for one dollar and thirty cents per gallon, thus, including the cake, realizing five dollars and thirty cents per bushel, out of which he paid the expense of manufacturing. It is, I am told, considered in England a profitable crop, although the price is not much, if at all, above two dollars per bushel. The gentleman was in high spirits as to the result, and told me he intended to go into the culture of it more extensively; but from what cause I do not know, I have never seen him or heard from him since—whether he failed in his experiments, died, or returned to England, I do not know. I have not, however, the least doubt that our soil and climate, are well adapted to the culture of this seed; it is of the same family with the cabbage, which every one knows grows luxuriantly here. We have, besides, such a variety of soils and climates in our country, that if it will not succeed in one district it certainly will in some other.

Another seed, valuable for oil, is the sun flower. I have never tried this, but am told it produces a very excellent sallad oil. I have no doubt the culture of it, properly managed, would be both useful and profitable.

The bene seed cultivated in the southern states, produces a valuable oil, and yields more than any seed I know of; it is said that one hundred pounds of seed produces ninety pounds of oil. I never tried the experiment fairly, but have no doubt as to the fact. Some years since, I expressed a barrel of the seed, but do not now remember the quantity produced; it was, however, such as to astonish me. The seed was eight years old, and had become in a manner rotten and rancid; the oil, of course, was not fit for the table; but it was, nevertheless, beautifully transparent and fluid—more so than any I had ever seen. It struck me that it might be valuable for watchmakers. I believe I have a small quantity of it left, and should like some one who knows more of that matter than I do, to try it.

The common thin shelled pig nut of our country is said to make an excellent sallad oil; the manufacture of it is easy; the shell is so thin as to interfere but little in the process: the nut is put into the mill, and ground up without removing the shell.

The cotton seed, if hulled, will yield a large quantity of oil; and I am glad to learn that attention is being paid to it. I once manufactured a small quantity, grinding the hull and cotton fibre with it; the quantity of oil produced in this way will not, of course, pay the expense of manufacturing it, so much of the oil being absorbed by the hull and cotton. Your correspondent does not appear to be practically acquainted with the plan of taking off the hull which he suggests, by means of a barley hulling machine. It is totally impracticable, for the following, among other reasons: first, if the result could be accomplished in that way, the expense of power, labor, &c. in doing so, would be such as to leave little or no profit; it would, in fact, be much more trouble and expense than all the rest of the process of making oil;—second, the seed cannot be hulled in that way. I speak from experience, being practically familiar with the process of hulling barley; the reason is, that when the grist is put into the machine, and the stone had penetrated through the hull, and come in contact with the soft and greasy parts of the seed, it would become so greased, or to speak technically, glazed, as to render it perfectly incapable of doing any more work; the seed would then come out in pretty much the same condition that it went in. I rather think a method similar to that which is used in chocolate mills for separating the hull from the cocoa, would be more feasible. The nuts are broken up by being passed through rollers of a peculiar construction, and the shell is afterwards blown out by a common fan. The objections to this plan are, the difficulty of breaking up the cotton seed, on account of its toughness; the further difficulty, from its adhesiveness, of separating the hull from the kernel of the seed. I have been told that some person at the south has succeeded in making a machine for hulling cotton seed, and I perceive among the list of patents in the Journal for November, one for a machine for that purpose; the description of it, however, is so imperfect, that I cannot exactly understand the nature of it. If, as is said, it does hull one hundred and fifty bushels per day, it is an important matter, and the object is attained.

The above remarks have been hastily thrown together, after reading the essay above alluded to; they come from one who is in a measure practically acquainted with the subject, and may perhaps answer some useful purpose.

ANSWERS TO QUERIES IN NO. 9.

To the Editor of the Farmers' Register.

Charles City Co. Feb. 26th, 1834.

Nothing could afford me more pleasure than to answer the call of a brother farmer from Essex county, through your truly valuable publication

(in No. 9;) and to tender, freely, any information I may possess upon the subject of agriculture.

The harrows used for putting in our wheat crop are square—composed of ten pieces of oak timber, four feet nine inches in length; five of these are three inches square, with mortises through them, at the space of twelve inches apart, for the remaining five pieces or 'slats,' to pass through, (which are three inches by one.) The teeth, which are of iron, and twenty five in number, pass through at the intersection of the mortise and slat, so as to secure the whole together. The teeth are twelve inches in length, and one square, being drawn out to a point, and put in so that one edge will be in front, (or diamond style.) It may be necessary to mention that the chain by which the harrow is drawn, should be attached across the harrow at the second tooth, otherwise it will furrow the grain. The teeth should be kept sufficiently long and sharp: if not, your work cannot be well executed. I should not consider very heavy harrows so necessary for light or friable soil; but on stiff, I greatly prefer the land to be well penetrated and combed by them. Harrows of such dimensions as the above, are a good tug for three horses.

The land for corn (which has been preceded by a wheat crop,) lies in eleven feet beds. If the land should be of a wet character, and it is desirable to keep it as free from water as possible, I should undoubtedly recommend their being reversed; that is, throwing one half of each bed to the former bed furrow, and thereby making on that, the ridge, or centre of the bed for corn. There will be no unevenness in them at all, and no obstruction whatever will be found from the old water furrows, as presumed by your correspondent.

The operation of reversing for corn is a beautiful one: and the land is kept entirely dry by opening a few temporary furrows at the headlands, or wherever most suitable for its effectual draining. The corn is then planted in these beds, two rows on each. When the same land is put in wheat in the fall, the bed furrow, or finishing furrow, which was made by the process of reversing for the corn crop, is made the centre of the bed for wheat. By this mode of causing the furrow to be the centre of the bed after each ploughing with the large ploughs, the land is not thrown up too high, and yet quite enough so, to be kept well drained. Indeed the land is much more easily and readily ploughed in this way, than any other mode I have ever tried.

If preferred, the land can be broken up and made almost a perfect level or even surface, by ploughing across the beds, and then harrowing it in the same direction, particularly if the corn crop has been laid off in checks, and cultivated both ways.

With regard to the time of sowing plaster of Paris, there is a diversity of opinion with us. Some of our best farmers think sowing it the first spring on the wheat, causes the rust in that crop; and consequently defer it until the second. I almost invariably sow it the same spring that I sow the clover seed, and this is done so soon as the young clover gets three good leaves; for if it can be secured the first summer from the hot burning sun of our climate, there is but little danger of losing it afterwards; and certainly it is much aided in getting a better growth, from the stimulating effects of the plaster, by the time the wheat is removed. I have suffered much from the rust in my wheat, but have never been able to discover that the wheat upon which plaster had been sowed, suffered more than the rest that was not plastered. If I could, I should sow it both the first and second spring.

A JAMES RIVER FARMER.

SUGGESTIONS FOR THE DIFFUSION OF AGRICULTURAL KNOWLEDGE.

To the Editor of the Farmers' Register.

Halifax Co. N. C. Feb. 25th, 1834.

Sir,—I do not believe there is one subscriber to your agricultural paper in Halifax county. How is this to be accounted for? Because this is not an agricultural county? No—nineteen out of twenty of the inhabitants not only expect their daily bread, but the means of comfort for their families, and the education of their children from the productions of the soil. Is it because they have no confidence in the editor? Certainly not, for they have never read an article from your pen, and but few know that such a person exists, or such a paper is published. The American Farmer, of a prior existence, fares but little better.

Permit me to suggest, (I fear in rather unintelligible language, but in the sincerity of conviction on my own experience,) what I believe to be the cause, and then the remedy. Last fall your Essay on Calcareous Manures fell into my hands. I read it with avidity, and every page showed satisfactorily that the ready pen was writing what the experienced head had well understood, and maturely digested: and conviction of the truth necessarily followed, as far as rightly understood.

But sir, we cannot, from a written description of soils, understand or decide to what class our lands belong: every farmer is not a chemist, and I find it quite impossible to follow your directions for analyzing soils; and to most farmers, your language, though critically correct, and as simple as the nature of your subject will admit, is unintelligible jargon;—hence, ordinary men, if they were subscribers, would rise from the perusal of your paper unbenefitted. We do not call things by the same name: what one man calls a *loamy soil*, another calls *alluvial*—and a third, who may be called in as umpire, avows most positively that the terms are *synonimous:* and many a man, possessing wealth, and having to an eminent degree the confidence of his neighbors as a man of information, will strenuously object to any theory of the rotation of crops, if it embraces the three or four shift system. And what do you think is generally understood by the four shift system in many parts of North Carolina and Virginia? Why, sir, to cultivate the land one year, and let it lie idle three—that is, to *shift* the crop from one field to another for four years; not to shift the kind of grain or seed planted. Indeed, I know a man that was by some means convinced that such a system as the three or four shift plan was requisite, and who commenced, and actually succeeded in clearing and enclosing three times the land his hands could till. The expense and labor of keeping these shifts enclosed, would soon have made him a bankrupt, if persevered in. When a writer in your paper recommends a "shovel plough," he might as well

put the name in Hebrew characters. One contends it means nothing more nor less than the old *fluke hoe* of antediluvian memory; another contends that it is the *scootee* that is meant, for we don't call things by the same name even in the same county.

How then, are farmers, whose education has not been so liberal, or whose business has kept them mostly at home, to arrive at the information with regard to their soils, indispensably necessary to a judicious system of manuring? How are they to become acquainted with the agricultural instruments used and approved of by their more intelligent brethren? Through your valuable journal much information may be acquired, no doubt; but as I said before, much of it is unintelligible; and even if accompanied with plates, as many of your numbers probably are, where shall we find a mechanic, (in a slaveholding state, where the mechanic arts are mostly confined to ignorant negroes,) that can look at a print and make a plough that will run three furrows? At some unguarded or unimportant joint, as it was thought, the plough gives way, the project is abandoned in despair, and 2 days labor, at 75 cents per day, is charged to the wild and visionary editor. These questions are hard to answer: they have often been propounded with but very unsatisfactory answers. Can it be gained by agricultural societies? Experience says no. But few of any society have travelled much; and fewer still for the express purpose of making an agricultural tour, and very few would be willing to task themselves with the labor of writing out an essay, to be read before a society, if they were not to be equally benefitted by the lucubrations of others; and it could not be expected in any little county society, that there should be many men of that kind of travel and experience which is necessary. Permit me then, with all modesty and deference, to suggest the following plan, which, if not a correct one, is as to me original, and I hope some of your correspondents will improve upon it, (for if you think it worthy, this is for publication.) The plan is, let some competent man, (—— ——, *Esq.* if posssible,) who has travelled extensively, and had experience in farming, commence a tour: let him take with him some acids, scales and weights, ounce glasses, blow pipes, and the necessaries for analyzing soils: let him announce that he will be at —— on such a public day, say at court, where and when he will address the public on the subject of agriculture, (he may make his audience select by having tickets for admission;) he may make known that he has the means, and will accompany home, for the purpose of analyzing soils, such as choose to employ him at $— per diem; he can make it a business to collect information for your journal, and enlarge your subscription list; he may organize agricultural societies, or schools, throughout the county—which, by visiting quarterly, and addressing on such subjects as the season and state of crops might require, be beneficial to them, and they of course to him. We have our itinerant tacticians and military schools, which are well paid; and cannot agricultural societies, or schools, be sustained on the same grounds? We pay a Yankee itinerant, who patches our old wooden clocks; and will we not amply compensate a scientific man who shall walk over our farms, and instruct us in its nature, in its defects, and the remedies? Surely we will, and that amply. Ten dollars per diem would be an inducement that science would not blush to receive, and many would rejoice to pay on those terms.

The agricultural lecturer would say to his employer, "Here, sir, you have calcareous matter; here too much alumine—bring sand; here too much sand—bring clay; there is a bog—haul ten loads of that bog mud to each acre of that field; here you must have a covered ditch; there you should have a meadow; this lot will suit clover—that, herds grass; here you need never sow wheat—the soil does not suit; there, if you sow oats, your land is impoverished; on that piece of ground, you may cultivate the thorn for hedges; on that you may plant cedars; live fences are, or are not desirable, &c. &c. Let him look at the farming tools; let him suggest improvements in the construction of barns, stables, and farm pens; and point out where a compost bed could be easily and profitably formed—all which he could do on the spot, and for which he would be amply compensated.

Mr. Editor, be pleased to take these hints under consideration, and court from your correspondents an opinion of their practicability; and thus, perhaps, something may be said likely to prove profitable.

F. G. A.

[We do not agree with our unknown correspondent F. G. A. in the details of his plan, though much in favor of his object, and of some of the means proposed. Agricultural tours certainly would produce much benefit to the individual farmers travelling in search of information, as well as still more to the public, by their published reports.]

VENISON HAM MANUFACTORY.

From the [Ohio] Farmer and Mechanic.

The following article has been marked for our notice in the Wheeling Gazette, and an inquiry propounded as to the truth of the statements. In reply, we can assure the writer that an establishment for "using up" sheep, was in operation in this neighborhood, until very recently; but is now suspended for the present, although it may be resumed during the next autumn. The business, however, is not, we think, of the stamp the writer supposes; being conducted, not by foreigners, or the agents of foreigners, but by two respectable farmers from near Geneva, state of New York, where they have carried on the above business largely for eight years past. So far from seeking to destroy the sheep, or injuring the wool growing business, at a present sacrifice, they make a profit of from twenty five to forty dollars per hundred on the sheep they butcher, and this alone is their inducement. It is supposed the effect will even prove beneficial to the breed of sheep by destroying the indifferent stock heretofore reared by our farmers, and causing their place to be supplied by a superior breed. So far from being true that they seek only ewes, wethers are preferred, though they generally take entire flocks, paying an average of about $1 12½ per head. The sheep are collected in large numbers, the heads chopped off, the *horns*, especially the crookedest and largest, saved for various purposes, the *tongues* cut out and salted away in barrels as a great delicacy, the rest of the *head* is then thrown into the boiler, where, two or three hundred together, they are well steamed, and afterwards pressed in large cheeses, in a press resembling a cider press, thus

forcing out every particle of tallow; the cheese is then thrown to the hogs, of which a great quantity are kept to be fed on the offal. The *skins* are then taken off, and having been stripped of the wool, they are sold to morocco manufacturers, &c. the *wool* being converted into casinets, &c. and the *tails* sold to the hatters. The *intestines* are thrown to the hogs, unless saved for fiddle strings. The *blood* is saved for the salt manufacturers; and certain *bones* for handles, &c. The hams are then taken off, and having been properly cured, make first rate venison, being, as Jack Downing would say, "a great deal better by half than rale deer meat." The rest of the carcase is treated just as the head was. Thus, by economy, and carrying on the business largely, they make a handsome profit, where a person acting on a less scale would lose. The whole number slaughtered at their establishment in this neighborhood, last season, was 6700.

Various speculations have been offered, in this neighborhood, as to their object, and many believe with the correspondent of the Gazette, that their object is to destroy the sheep of the United States, for the benefit of foreigners. Such is not, however, the opinion of those best informed on the subject.

"*Venison Ham Manufactory.*—The manufacture of this article is said to be carried on on a most extensive scale in the neighborhood of Zanesville, Ohio. My information of the existence of this establishment was obtained by accident, and in the following manner. Wagon loads of *sheep-skins* from the west, to the number of several per week, have been discharged at this place, and, upon inquiry from whence such immense quantities of such an unusual article could come, I have been informed that a *butchery* has been 'in the full tide of successful experiment' since the commencement of winter, a few miles from Zanesville. A gentleman of this place who was at Zanesville during the first week of January, informs me that then about 4000 head was supposed to have been slaughtered. The fore quarters are thrown away, the hind quarters are sold at thirty seven cents a pair, and all that could not be sold are salted down for *venison hams*. The skins are sold for twenty five cents a piece, or forwarded to the eastern market. The revenue from the skins, hams, and tallow, was estimated by the manufacturers (murderers more properly,) to be about one half of the cost of the stock on foot. They are very particular in their selections. They never purchase entire flocks, nor yet the best animals of a flock, but the worst, confining themselves exclusively to *ewes*. It is to be wished that all editors throughout the wool growing region of our country, would put their readers on their guard in this particular; that if there are any farmers, who of necessity, must sell any part of their stock to these agents of foreigners, that the venders may make it a *sine qua non* that at least a fair proportion of *wethers* be included in all such transactions of bargain and sale.

A. Z.

[The foregoing statements may be interesting to the connoiseurs of venison hams, whose consumption serves to support the new "manufactory" described. But besides, the letter of A. Z. is worth notice, as a remarkable instance of the stupid jealousy which converts customers into imaginary enemies, and intended destroyers. It is strange indeed, that any one who has the ability to write a decent paragraph for a newspaper, can believe that any "foreigners" have combined for the purpose of destroying our stock of sheep; and especially by the notable scheme of *buying them up in great numbers, and at full prices.* The smallest share of reasoning power ought to show, that any new demand, and additional market for sheep, (even if it was to burn brick-kilns with their carcases for fuel, as travellers say has been done in Buenos Ayres,) must increase the profit of their breeding, and of course, their numbers. But though this supposition of A. Z. is more manifestly foolish and ridiculous, it is not more untrue than another which has been extensively received, and has helped greatly to support our system of protecting duties to force manufactures—viz: that foreign manufacturers would combine to sell their commodities to us at losing prices, for the purpose of underselling and breaking down the factories of this country, if the latter were not thus protected by law. Such combinations may be supposed possible, whenever our farmers will "combine" to sell their wheat at only half the price which it would command, for the purpose of ruining the cultivators of the high priced lands of Europe, and then monopolizing the supply of the grain market.

If any persons have reason to complain of the new venison hams, it can only be they who buy and eat them. But however little the trade may speak in favor of the truth and honesty of the manufacturers, we cannot charge them with having done any injury to those whom they have supplied with a cheap article, which though counterfeit, is not distinguishable from, and has served as well as the best.]

IMPROVEMENT IN THE MODE OF RAISING ANNUAL FLOWER SEEDS.

From the Gardener's Magazine

After sowing the patch of seeds, and covering it with fine moist soil, place a garden pot inversely over it, until the seeds have struck root; then raise the pot up two or three inches, keeping it thus supported for a few days, and then remove it entirely. The pot not only keeps the soil moist, but by the sun heating the pot, the seeds come up much more quickly than otherwise they would do, in consequence of which the seeds need not be sown so early by a fortnight or upwards. The young plants are therefore less exposed to injury from cold or late spring frosts. Hollow tiles, instead of pots, answer equally well, except where mice are, they have access to the ends.

SALT AND LIME FOR MANURE.

From the Southern Agriculturist.

Dr. Cornelius Dupont, of St. George's Parish, made an experiment, a few years ago, with a mixture of quicklime and salt, as a manure, which he found highly beneficial. The land to which this mixture was applied, was a silicious soil with an aluminous basis. Vegetable manure was first spread upon the list, and after the land was planted, the mixture was strewn upon the top of the bed in the proportion of one bushel of salt or two bushels of lime to the acre. The product of cotton, resulting from this application, was nearly double the usual crop gathered from the same land cultivated in the ordinary way.

UNDULATING RAILWAYS.

From the American Rail Road Journal.

Undulating railways have attracted much attention and discussion in England. The inventor, Mr. Badnall, has met with great opposition from various sources; he has, however, steadily pursued his labors in perfecting his invention, and at the same time kept up a controversy, always in a gentlemanly, yet decided tone, with his opponents, until he has demonstrated, by actual and repeated experiments, its *entire* practicability. So well, indeed, has he satisfied those who have witnessed his experiments, that Mr. Stephenson, the distinguished engineer of the Liverpool and Manchester rail road, has joined him as a partner in civil engineering.

In Nos. 48 and 50 of vol. 2, we gave, from a London paper, some account of experiments made on the Liverpool and Manchester railway by Mr. Badnall, to test the correctness of the *undulating* principle as contended for by him. They were not, however, given at length in the London paper, and therefore we re-publish them from the London Mechanics' Magazine, as given by Mr. Badnall himself, and we shall publish several articles from the Mechanics' Magazine, to explain more fully Mr. Badnall's views and theory, that the subject may receive in this country the consideration which its importance demands.

From the London Mechanics Magazine.

Further Experiments on the Liverpool and Manchester Railway, to determine the correctness of the Undulating Railway System.

Sir,—Since I had last the pleasure of addressing you, we have been enabled to try some further experiments on the Liverpool and Manchester railway, the decisive result of which will, I doubt not, fully establish, in your mind and in the public opinion, the merits of the undulating principle.

On Wednesday last, the 16th instant, we met as before on the *Sutton inclined plane*. On this occasion it was agreed by the engineers present, viz. Mr. Robert Stephenson, Senr., the Messrs. Dixons, Mr. Dagleish, and myself, that the truth and validity of the principle, as well as the comparative advantage to be derived from its adoption, would be effectually determined by the following test:

As great a velocity as possible being attained by the engine and load, before reaching a given point near the foot of the inclined plane, the time was to be accurately ascertained which the train occupied in ascending from that point to a state of rest.

The power being thus reversed, the time was to be accurately measured which the train occupied in descending from a state of rest to the point from which it had previously ascended.

Hence it would be obvious, that if the *descent* were made in less time than the *ascent*, the velocity generated at the foot of the plane would be proportionably greater than the velocity of the ascending train at the same point, and, consequently, the demonstration would be clear that the engine and train would not only have ascended to an opposite elevation equal to that from whence it fell, but to a *greater one*, the extent of which would be in proportion to the velocity attained.

Experiment 1.—The "Liver" engine, and a load of thirteen wagons (weighing in all 72½ tons) after traversing a distance of three fourths of a mile to acquire a sufficient velocity, ascended the inclined plane 278 yards, the time occupied in performing the ascent to a state of rest being 90 seconds, viz. velocity at foot of plane being about 12.60 miles per hour, and the average velocity about 6.30 miles per hour.

Experiment 2.—The *power being reversed*, the engine and train descended 278 yards, viz. from a state of rest to the point from which they had previously risen, in 50 seconds. The velocity at the foot of the plane being about 22.70 miles per hour—average velocity about 11.35 miles.

Experiment 3.—The engine and train having traversed three fourths of a mile to generate velocity, ascended to a state of rest, viz. about 278 yards in 75 seconds. Velocity at the foot of the plane being about 14.12 miles per hour—average velocity about 7.6 miles.

Experiment 4.—The power being reversed, the descent of 278 yards was accomplished in 40 seconds. Velocity at the foot of the plane being about 28.32 miles per hour—average velocity 14.16 miles.

Experiment 5.—The ascent of 278 yards was made in 80 seconds. Velocity at the foot of the plane being about 14.22 miles per hour—average velocity 7.11 miles per hour.

Experiment 6.—The descent of 278 yards was accomplished in 49 seconds. Velocity at the foot of the plane being about 23.22 miles per hour—average velocity about 11.61 miles per hour.

AVERAGE.

	Total spaces passed over to generate maximum velocity before ascending.	Times occupied in ascending 278 yards.
Experiment 1,	1,320 yards.	90 seconds.
Experiment 3,	1,320 yards.	75 seconds.
Experiment 5,	1,320 yards.	80 seconds.
Total,	13,960 yards.	245 seconds.
Average,	1,320 yards.	81⅔ secs.

	Total spaces passed over in generating maximum velocity in descending.	Times occupied in descending 278 yards.
Experiment 2,	278 yards.	50 seconds.
Experiment 4,	278 yards.	40 seconds.
Experiment 6,	278 yards.	49 seconds.
	834 yards.	139 seconds.
	278 yards.	46⅓ secs.

From the preceding statement it appears, that the utmost average maximum velocity which the Liver engine could attain on this occasion, at the foot of the plane, after traversing a distance of 1,320 yards, was about 13.926 miles an hour; by which means, the power being continued, she was enabled to ascend an inclination of 278 yards.

On the other hand, it appears that the same engine, with the same load, (the steam being kept up in every instance to a pressure of about 50 lbs. to the inch, generated a velocity, after descending 278 yards, of about 24.488* miles per hour, evidently

* The velocity in these instances is calculated from the *average* number of seconds occupied in ascending and descending; thus, 278 yards being = about 6¼ of a mile, we have the descending line 46⅓ ⋈ 6¼ = 294 and 3,600 seconds ÷ 294 ⋈ 2 = 24.488 maximum velocity.

proving that the engine and train would not only have mounted another summit of equal elevation to that from whence it fell, but would, *at the highest point*, have been travelling at a velocity of more than ten miles an hour, with the full means of increasing that velocity to any desired extent over the succeeding undulations.

Although the preceding experiments had, to the satisfaction of all present, decided the superiority of the undulating principle, I was anxious to know the result of a trial with a double load. I therefore proposed, (it being too late an hour on this occasion,) to attain, on a future day, a velocity of twenty miles an hour, with a double train of goods, and two engines. I had, on several occasions, published my opinion of what that result would be; and I have now the satisfaction of adding the particulars of this important experiment, which, I need not say, *more than confirms* all my anticipations.

On Sunday morning last, two locomotive engines, viz. the "Firefly" and the "Pluto," left Manchester with a train of loaded wagons, weighing 150 tons, exclusive of engines and tenders, the whole length of the train being about 155 yards.

On arriving at the Sutton inclined plane, it was determined to adopt the same method as on the last trials, of proving the merits of the principle. Our reason for appointing Sunday for this meeting will be obvious, when it is considered how dangerous and inconvenient it would be to try experiments with such a load on any other day, when the trains are almost constantly passing and repassing.

It may be known to some of your readers, that the French government have lately appointed a certain number of their most eminent engineers to visit this country, with a view of acquiring all requisite information preparatory to the construction of several intended French lines of railway.

These gentlemen, nine in number, were present on this occasion; their names were as follows: Mons. Navier; Mons. Goubeau, Jugement des Ponts et Chausses; M. Arnollet, Ingenieur en chef du Ponts et Chausses, a Dijon; M. Eugene Nuncann, Ingenieur des Ponts et Chausses, No. 1 Rue Castiglione, Paris; Mons. Dausse; Mons. L. L. Vallee, Ingenieur en chef des Ponts et Chausses; Mons. J. Moistard, Ingenieur de la Marine; Mons. Paris, Lieutenant de Vaisseau; Mons. K. Mamgan.

The English engineers present were Mr. R. Stephenson, Sen. of Manchester, (with whom I have recently entered into partnership as civil engineers,) Mr. Dagleish, Sen., Mr. Dixon, Sen., Mr. Dagleish, Jr. and myself. In addition to whom were many other individuals deeply interested in railways, and of general scientific acquirements, among whom were Mr. Case of Summerhill, near Liverpool, Mr. Garnett of Manchester, (editor of the *Guardian*,) and others.

The following statement cannot fail to form an interesting part of your publication.

Experiment 1.—Two locomotive engines, the Firefly and the Pluto, being attached to the train above mentioned, and having traversed a distance of *one mile*, to generate a sufficient velocity, arrived at the point from whence the ascent was to be measured, at a velocity of about 20.28 miles per hour. The Pluto then left the train, and the Firefly alone ascended with the load (working the whole way) to a distance of 575 yards, 116 seconds—average velocity being about 10.14 miles an hour.

Experiment 2.—The power of the Firefly being reversed, the *engine and load* descended 575 yards in 74 seconds. The velocity at the foot of the plane being about 31.70 miles per hour—average velocity about 15.85 miles per hour.

Experiment 3.—The Firefly and Pluto having traversed the same distance as before, generated, at the foot of the plane, a velocity of about 14.34 miles per hour. The Pluto then left the train, and the Firefly and load ascended (power working) 315 yards in 90 seconds—average velocity about 7.17 miles per hour.

Experiment 4.—The power of the Firefly being reversed, the whole train descended 315 yards in 65 seconds. Maximum velocity 19.82—average velocity 9.91.

Experiment 5.—The same engines and load, working about $1\frac{1}{2}$ miles to generate velocity, attained at the foot of the plane a velocity of about 18.32 miles an hour. The Pluto left as before, and the Firefly and load rose $457\frac{1}{2}$ yards in $102\frac{1}{2}$ seconds—average velocity about 9.16 miles per hour.

Experiment 6.—The Firefly and train descended $457\frac{1}{2}$ yards in 80 seconds. Maximum velocity 23.22 miles per hour—average velocity 11.61. N. B. In this instance some delay occurred in reversing the power, which will account for the comparative difference in time.

Throughout the whole of these experiments it will be seen the results were so much in favor of the undulating system, that it was evident a far greater load than 150 tons could be moved by the Firefly, at an average velocity of 15 miles per hour from one summit of a curve to another. The dip of inclination being about 1 in 99, and the total length of the undulation varying from 630 to 1150 yards.

This led me to propose a further experiment, and I think I may safely add, that one more important in result was never before tried in any country.

Experiment 7.—The two engines, as before, attained at the foot of ascent a velocity of about 19.04 miles per hour. The Pluto then left the train, and at the same moment, the Firefly *shut off her steam*. The whole train then rose by *momentum alone* (the weight of the train, including engine and tender, being near 164 tons,) to the distance of 323 yards in 70 seconds—average velocity about 9.52 miles per hour.

Experiment 8, *and last.* The Firefly and train descended 323 yards (power working) in 66 seconds! Velocity at foot of the plane being about 20.04 miles per hour—average velocity about 10.02 miles per hour.

Thus the preceding experiments most unquestionably prove two most important facts—not only that a given locomotive power can convey from one summit of a curve or undulation, to another summit of equal altitude, *double the load* which that same power can convey at the same velocity on the level; but that a given locomotive engine can convey, from one summit of a curve or undulation to another summit of equal altitude, *double the load* which it is capable of moving on a level at a like velocity (see last experiment,) *by the employment of the steam force throughout only half the distance!*

These results lead me to go *one step farther.* It

is my opinion, that if such a weight were to be added to the 150 tons moved on this occasion, as would be a *maximum* load for *three locomotive engines* on a level at 15 miles an hour, the Firefly alone (her power being equal to either of the other engines,) *would move* the whole train from one summit of a curve to another of like altitude, at an equal average velocity, viz. 15 miles per hour.

If any of your readers, whether witnesses or otherwise of these interesting experiments, can correct any error of opinion or of statement in allusion to them, I shall be exceedingly happy to recognize and acknowledge it. In the mean time, I think, sir, I may congratulate myself upon having stamped, by this letter, a value that will be long appreciated on the correspondence (*pro* and *con*,) which your Magazine contains on this subject; and I am as happy in feeling that every individual who witnessed the recent experiments was fully satisfied with the importance of the results, as in believing that, in defiance of prejudice and long formed erroneous opinions on this subject, the public will before long acknowledge, appreciate, and be benefitted by the "*Undulating Principle.*" I am sir, with great respect, your very obedient servant, RICHARD BADNALL.

TO THE FARMERS OF THE WEST.

From the Genesee Farmer.

The history of the agriculture of the river counties, should serve as an admonition to the west—*not to be too prodigal of the stores of vegetable food with which nature has enriched their soils.* It is the accumulation of centuries. A fraction of this time may serve to dissipate and destroy it. How many improvident youth, unconscious of the dire consequences, and deaf to the admonitions of experience, by an over action of their physical powers, have laid the foundation of incurable disease and premature death. Let us not imitate such.

The natural fertility of the soil was as great in many districts which border the Hudson, as in the new counties of the west. But by a reckless husbandry they were reduced at one time to a sterile and wretched system. Within the recollection of the writer, many of these lands did not yield the third of the crop they do now, under a better system of management. The truth is, every thing was carried off, and comparatively little returned to the soil. The "suitable" division into "pasture, meadow and plough land," which is yet the boast of many of our farmers, was scrupulously pursued, till the finer grasses disappeared, and the meadows yielded only a thin stunted herbage,—and until the plough land became too impoverished to yield a decent crop of grain. Necessity, which is said to be the mother of invention, and the spirited enterprize of a few intelligent individuals, finally led to a new era in their husbandry. The introduction of gypsum and grass seeds was the beginning of improvement. Rotation of crops,—economy of manure,—and better farm implements followed. The farm stock then began to be improved, and sheep husbandry to be increased. Improvements have been prosecuted till a portion of the farms are now as profitable as the new lands of the west; and the good examples are yearly enlarging the sphere of their influence. The pine lands of Kinderhook were once considered not worth cultivating; and the time is not distant when they were sold at $3 an acre. Good farming has enhanced their value to $40 and $60 per acre, at which price some farms have been recently sold. The pine lands of Saratoga are experiencing a like change, and under a judicious system of alternate husbandry, economy of manures, and efficient draining, they must rapidly advance in productiveness and value.

Too many of our western farmers seem disposed, by practice, to sacrifice permanent good for present gain—to destroy the goose which lays their golden eggs. Many new lands increase in fertility some years, without manure, from the accelerated decomposition of vegetable matter which goes on in the soil in consequence of its exposure in tillage to the increased influence of heat and air, the prime agents, in connection with the water which is always present in the soil, of putrefaction. The more rapid the putrefactive process, the greater the exhaustion of fertility. If we would *preserve* the high character of our lands for fertility, we must pursue the same course which others have successfully adopted to *restore* fertility to those which have become worn out. We must not take in succession exhausting crops of grain; we must alternate between the artificial grasses, roots and other ameliorating kinds. We must be more saving of our manures, and more judicious in applying them, before they have lost half of their value by fermentation. Our long manures will feed a hoed crop, by their gaseous matters, while they are undergoing the change to fit them for the small grains. The oftener we intervene grasses, the less exhausting the rotation. While we guard against the errors, which impoverished the old counties, let us imitate the practices which have restored them to fertility; and we shall then be enabled to transmit to our children a truly invaluable inheritance. B.

THE LARGE OATS.

From the Genesee Farmer.

My unwillingness to tax you with postage, from such a distance, in reply to an inquiry made in your valuable paper of July 20, "where the large oats can be obtained that weigh *forty eight pounds* to the bushel?" has prevented my offering till now the required information. They may be obtained from either England or Scotland, where their first cost is from six to seven and even eight shillings sterling the bushel, making the cost in this country, from two to three dollars a bushel. I last spring, obtained a few bushels of such oats by a packet ship from London; the kernel was round, thin-skinned, and without tail, weighing forty eight pounds per bushel. They were sown on a light piece of ground the 3d of May, and were harvested the 21st of August. The straw was firm, and stood up well, and the yield appeared abundant, but I question if the produce will weigh as much per bushel, as the seed. For this difference there are at least two sufficient causes—the one is that the soil was too poor; the other that in consequence of not having English seed enough to sow out the field, it was finished with the common white oat of the country, weighing not more than 32 lbs. the bushel. This last circumstance would destroy my confidence in the produce as seed oats, though I still consider them infinitely better than the common oats for that purpose; when thrashed, I shall ascertain their weight per bushel."

GYPSUM OR PLASTER.

From the [Kinderhook] Columbia Sentinel.

If we turn to the 9th volume of the Agricultural Magazine, we shall see that comparative trials were made between this and other manures, on a stoney clay, mixed with a little loam, to ascertain the best manure for wheat. "A five acre field was divided into five equal parts, exactly an acre in each. They were equally well ploughed and laid down to wheat, after being manured as follows:

On No. 1 was sown 6½ bushels of gypsum.

On No. 2 was put a compost manure, consisting of lime, rich earth and dung.

No. 3 was manured by yarding cattle on it.

On No. 4 stable dung was thinly spread.

On No. 5 lime prepared from oyster shells was sown.

The product was from

No. 1, forty bushels.
No. 2, thirty-six bushels.
No. 3, thirty-five bushels.
No. 4, thirty-three bushels.
No. 5, thirty-bushels.

The seed wheat was of the best Sicily kind, and weighed 62 lbs. per bushel—the product weighed 63 lbs per bushel."

Next follow eight different experiments of the effects of gypsum on the different grasses, excepting clover. In all cases the quantity of land was the same, and the soil as much alike as possible. The results uniformly proved that the profits were from ⅓ to ½ greater than where none had been used. On clover the benefits were still more marked.

The gypsumed yielded per acre a product of hay equal to	15
The ungypsumed only equal to	5
The gypsumed yielded in seed per acre, a product equal to	30
The ungypsumed yielded in seed, do. only	5½

The experimenter adds—"The invariable results of the several experiments, which are faithfully, and he trusts correctly stated, he thinks incontestibly prove that there is a most powerful and subtle principle in this tasteless stone; but by what peculiar agency or combination it is capable of forcing vegetation in such instantaneous and astonishing manner, time reserves for others to unfold."

From the above experiments, it is distinctly ascertained that gypsum produces its greatest effects on clover. Time and experience have confirmed this fact, and it is now generally understood that as a manure it is not so beneficial to the narrow leaved as it is to the broad leaved plants, such as clover and corn. Besides the above experiments, the general observation of farmers is conclusive on this point, and we could quote abundance of authority in proof of this position. I have seen one half of a field which had clover growing in it sown with plaster, and the other part remaining unsown. The eye could distinctly trace the part sown from the part unsown. First from the increased size of the one, and next from the sickly and yellow appearance of the other. The line of demarkation was so observable, that the cause of it was a frequent source of inquiry. But this is only one among many similar instances. My own experience and that of my neighbors fully bears me out in the opinion, likewise, that clover, to come up well and do well, must be aided by having the ground sprinkled with plaster as soon after it is sown as praticable. This is an experiment which I have frequently made, and have long since looked upon as a settled principle in farming.

Previous to the use of plaster and clover as a manure, (for they ought to go together,) what is now called the best of land in this vicinity might have been purchased for less than $3 per acre; and I have heard of several purchases being made at less than one dollar. Now this land is made to yield the interest of $100 dollars per acre, free of expense,—is constantly improving, and there are no farmers who are more lavish in the application of these two manures. I verily believe, deprive them of the use of clover and plaster, and their farms will degenerate, if not as low as formerly, still so much as to make their cultivation very unprofitable. Plaster does not do its maximum of good without it is sown on clover; and clover will not grow luxuriantly unless it is sprinkled with plaster—they mutually aid each other, and when both are freely used, they are a mine of wealth to the farmer. It is not because he has large crops of clover for hay, but this clover being turned under by the plough, is the best possible coating of manure that his fields can have to bring him heavy crops of wheat, corn and oats: not rye—his land is too good for it—it is too cheap a produce when wheat, which is more profitable, may as easily be raised. It is principally indirectly therefore that gypsum is so valuable as a manure. We are perfectly willing to concede that its good effects are not so distinctly remarked as formerly; the poverty of the soil made it then so peculiarly grateful to it, that it at once yielded a hundred fold. Now the quality of the soil having materially improved by its frequent application, they are not, of course, so observable. It ought to be enough for us that crops are growing more and more abundant. It is the proof that something is at work, in farther fertilizing the soil.

The sowing of gypsum has produced another and great revolution in farming, and materially lessened the labors of the farmer. It is by making it unnecessary for fields to lay a season to fallow, by which not only the use of the land is lost for the season, but you have the labor of ploughing two, and often three times for a subsequent crop of wheat. How much simpler and more profitable the process now. One year you sow your fields with oats, barley, &c. in the spring, at the same time you put on your clover seed and plaster. The subsequent year you have a fine field of clover, enough to cover the ground completely, and affording abundance of food for your stock for grazing You fatten them at the same time that you fatten your soil. The coming autumn the remains of the clover are turned under with a single ploughing—you sow on your wheat—apply your drag, and your work is done. The chance is, you will have a much better crop than by the old method of frequent ploughing and fallowing, even if you have added to your fallow land a thin covering of stable manure. When clover can be made to grow so thrifty as to crowd out all other plants, which is frequently the case, it is the best preparation that our soil in the present state of farming can possibly have. But it must have only one ploughing. The clover lay well turned over, must be permitted to remain there according to modern experience, and a heavy crop of wheat or corn is almost the invariable result.

MANURING.

Extract from the American Farmer.

I have heard many farmers say, that they had used lime as a manure without deriving any benefit from it, and I have no doubt of the correctness of their statements. I have used lime without being able to discover that it had any effect whatever; but the reason was, the soil did not lack that all important constituent, had no qualities upon which its chemical action could be beneficial, and was destitute of vegetable matter; but upon the very same earth, when subsequently manured as I have already stated, with bottom earth and lime, I found each load of nearly or quite as much value as would have been a load from the stable. I have used the same bottom earth without lime, but it was inactive, indeed worthless—I would not haul it for it. It is the marriage of the two, that makes them prolific. Marry lime to vegetable earth or vegetable matter (let the match be equal, of course I do not mean in quantity) on any soil, and the union will be followed, within less than nine months too, by a vigorous and healthy offspring. I have been careful in giving one bushel of shell lime to each wain-load of swamp mud or bottom earth; but I think the dose hardly large enough, for I notice that those spots in my fields which have robbed their neighbors of a portion of the lime that belong to them, send up uniformly a more vigorous growth. I prefer shell to stone lime, because the same amount of strength, covers so much more surface. This remark, reminds me of a fact which seems somewhat inconsistent with the opinion expressed at the beginning of this paragraph. In the spring of 1827, upon as poor a piece of clay as ever heard the squealing of a killdeer, indeed it had no soil at all, a cask of stone lime bursted, and a good deal of it was scattered about the spot and permitted to remain there—the next spring, hearty red clover came up "of its own head," and occupied the place.

One of my neighbors (but a more industrious man, and a much neater farmer than I am) has, I am satisfied, within the last eight years doubled his crops by the use of lime. He has the lime spread upon his ditchbanks and grubbed in; after it has remained there a few months, the compost is carted upon his fields. A skilful calculator remarked to me some time since, that the effect upon Mr. D——'s last crop of corn, of the lime heretofore applied to the field, would repay him all the money he had expended (many hundred dollars I know) to procure the article *for his whole farm.* He uses shell lime exclusively.

A friend of mine, who I hope is now better employed, who was a man of general science and a practical and scientific farmer, exerted himself for thirty years to improve a poor sandy farm. By the method of manuring which I am about to mention he effected more for it in the five years which preceded his death, than had been accomplished in the other five and twenty. From the shore of a salt-water sound to which the farm was contiguous, he littered his farm-yard with sea ware. In the fall he laid off with a plough, the field which he intended for the next year's crop of corn, in trenches seven feet apart, twelve inches in width and six in depth. The plough traversed the same furrow until the trench was sufficiently wide and deep—its sides were made by the bar of the plough. Those trenches were then filled with sea ware from the farm yard, and stable manure; the latter placed in the bottom of the trench, and making from a tenth to a sixteenth part of the combination: the trenches were then covered with the plough, and upon the ridges thus formed, the crop of corn was drilled the succeeding spring. After the laying by of the corn crop, the field had a year of rest, after which the intervals between the corn rows were treated and used as the rows had been. The advantages of that manner of manuring are manifest. Almost all the fertilizing properties of the manure which escaped whilst becoming decomposed, fed the crop—the bed of the manure was not broken open, nor was it exposed to evaporation, until the soil had become "seized in its demesne as of fee" of all its treasures, save those which had already produced food for man and beast—a few manurings in that way, will make a very poor field of any susceptibility rich.

STEAM THRASHING MACHINES.

From the Fifeshire Journal.

Steam thrashing machines are continually obtaining more favor among agriculturists, and when the greater convenience and increased cheapness of such an assistant on a farm are taken into consideration, the preference given it over the mills now in use will not be a matter of wonder. A machine of four horse power will thrash about 60 bolls (240 bushels,) in a day, supposing the crop to turn out moderately well, and the consumption of fuel for this work is at the utmost 8 loads of small coal, at 7d. each, amounting to 4s. 8d.; the driving, *if very distant*, may take a pair of horses one day, which call 4s. more; the whole expenditure for the power of the machine would thus amount to 8s. 8d., taking it under the most unfavorable circumstances. A mill of the same power (worked by two pair of horses) will only thrash 30 bolls, if the cattle are not overdriven, and as the keep of each pair cannot be reckoned at less than 4s. per day, there will thus be nearly the same expense for power, with only half the quantity of work. But this is not the whole advantage of steam, for it is well known among farmers, that the heavy incessant drag of the thrashing mill is most injurious to horses, and causes more wear and tear in their constitutions than any other portion of their labor. If the usual contrivance is employed to make them all draw equally, a horse of less stamina than the rest soon suffers by it; and if they are allowed to pull, each in its own fixture, some of the spirited cattle do all the work, and are hurt by it. Nor is the convenience less in another point of view, for it often happens that a farmer finds it desirable to sell, when he can very ill spare his horses for thrashing, and is thus obliged either to lose the opportunity of making a good bargain, or to let some part of the work of a hurried season stand back to set the thrashing mill in motion. Farmers, who have had experience for some time of the steam engine, say that they could not, beforehand, have imagined the convenience it affords them; on a farm of four pair of horses, an engine of the power we have mentioned, enables the farmer to do with three, and the remaining beasts, being no longer pulled asunder and exhausted by the heavy toil of the mill, are in better condition than before. Large machines, however, are no

advantage, and we should think that any farmer in Fife would be sufficiently accommodated with one of four horse power. To thrash 56 or 60 bolls is surely expedition enough for the most active farmer, and more can hardly be necessary at any time. The large engines require a greater expenditure of coal to heat them and get up the steam, and as this is equally necessary, whether much or little work is to be done, a great deal of coal is lost on every occasion, where the quantity of stuff to be put through the mill is not considerable. The steam-engine of four horse power may cost about £100, or a little more, which is nearly £30 above the ordinary mill; but for this increased outlay, the cheapness of working is a complete and sufficient compensation. The subject is one which deserves the attention of landlords as well as tenants, and it will, if we are not mistaken, lead to still greater changes and improvements. If steam-engines were once common about farms, their agency would often be found useful for purposes which at present are not thought of, and the possession of such a disposable power, like a giant continually under his command, will enable the farmer to turn many things to advantage which are now neglected.

CARROTS.

From Goodsell's Genesee Farmer.

Mr. Goodsell—In compliance with your request, and in fulfilment of my promise, I now make a short, simple, matter of fact, communication, relative to the crop of carrots which I raised last summer. The ground on which the carrots grew, is what may be termed, a gravelly loam. There is about one third of an acre. It has been cleared so long, that the stumps are all entirely gone. It has been constantly cropped, and has never had but very little manure; consequently it was much exhausted. The crops immediately preceding the carrots was Indian corn. The ground was ploughed in the fall after taking off the corn, the common depth, and left to the operation of the winter frosts. In the spring, a light dressing of barn-yard manure, was put on, and the ground was again ploughed the common depth. About the first of May, the ground was thrown into ridges of four furrows each. The ridges were thrown up as high and as narrow as they well could be, and smoothed, and flattened on the top with a rake. The seed was then sown in rows on the ridges, two rows on a ridge. The two rows on each ridge were twelve inches apart, and there was about three feet space between the rows of the respective ridges, or between the rows of one ridge, and the rows of another ridge, so that there might have been just twice as many rows in the field, if it had been all sowed in rows twelve inches apart. The sowing was quickly done with a machine which I contrived for the purpose, which was so constructed, that I could sow one, two, or three rows at a time, and as fast as I could draw it along. The seed was perfectly clean and mixed with dry sifted sand. There was some twenty or thirty times as much sand as seed, and in sowing, it ran together through a goose-quill, into a little furrow which the machine opened, and closed again after the seed had fallen in. But notwithstanding there was so much sand mixed with the seed, the carrots come up so thick that in thinning them I pulled up at least twenty times as many as I left. The barn yard manure brought in a prodigious quantity of weeds; and there was a prodigious quantity before, so that by the time the carrots were up, the ground was swarded with weeds. This made the first hoeing a tedious and sorry business, and thoroughly convinced me of the necessity of sowing carrots on clean ground. The preparation of the ridges, the sowing and the hoeing altogether cost me about twelve days work; whereas, could the seed have been sown thin enough, and had the ground been pretty clean, the labor certainly would not have been more than half as much. The digging of the carrots also proved a very laborious process; because the ground had never been worked more than half deep enough. Many of the carrots were half their length below where the ground had ever been worked. The digging was all done with a spade; and every body knows that spading virgin earth is hard work. This shows the necessity of very deep ploughing. This part of the work also took me about twelve days; so that by the time the carrots were secured, I had done about twenty-four days work, besides the team work. The team work consisted of three ploughings, one harrowing, hauling a little manure, and hauling the carrots to the cellar. I will now, Mr. Editor, make a statement in figures showing at one glance, the substance of the above communication.

One third of an acre, carrot field,	Dr.
To 24 days work, at 75 cents per day,	$18 00
To ploughing, harrowing, hauling, &c.	2 00
To rent of grounds,	2 00
	$22 00

One third of an acre, carrot field,	Cr.
By 265 bushels of carrots at 25 cents,	$66 25
	22 00
Clear gain,	$44 25

Allowing the team work and the rent to be equal to six days labor for one man, these added to 24 makes thirty days—$66 25 divided by 30, gives $2 20 per day, for all the labor that was done. On it is a return of more than three times the money laid out. I sold a part of the carrots for 37½ cents per bushel, but I think that 25 cents will probably be the market price. I am very sure that they may be raised a great deal cheaper than potatoes.

Mr Editor, my communication is before you. I have made it with diffidence, because I have never written for the public. And I have made it with reluctance, because, this is my first carrot field, and I am confident that there might be twice as many carrots raised, as I have raised, from the same ground, and at the same expense. If you think this communication worthy of a place in your paper, you are at liberty to publish it; if not, you are at liberty to put it in the fire. And in the mean time, if you, Mr. Editor, or any of your readers can give me any practical results or any useful hints relative to the cultivation of roots, I shall be very glad to be instructed; for I am confident, from what I have read, and seen, and done, that the cultivation of roots, even in this wheat growing country, may be made very profitable.

WELCOME EDWARDS.

Lima, (N. Y.) February 18, 1834.

[If we had not the reviewer's word as a guarantee that the work noticed below was a serious production, it might well be taken for a lost and recovered chapter, of the description of the College of Projectors, in Gulliver's voyage to Laputa. But as it seems the matter is no joke, we insert the following extracts and commentary, which may be taken, at the reader's option, either as intelligence of the most marvellous and astounding agricultural improvements, or merely as an amusing change from dull matter-of-fact articles.]

Ed. Farm. Reg.

REVIEW, FROM WALDIE'S JOURNAL OF BELLES LETTRES, (ATTACHED TO WALDIE'S SELECT CIRCULATING LIBRARY.)

The Paradise within the reach of all men, without labor, by powers of nature and machinery. Addressed to all intelligent men. By J. A. Etzler. 12*mo. pp.* 215. *Pittsburg*, 1833. *Etzler & Reinhold.*

The term " march of intellect," has become so common-place, as scarcely to be allowed in our recent authorities; but we must be permitted to revive it on the present occasion, inasmuch as Mr. Etzler has stolen a march upon all the intellects of his predecessors, and we apprehend his successors also. What think you, ye laborers with the spade and the pen, has been accomplished *in the brain* of this western luminary?—truly nothing short of the greatest happiness of the human species, and all, as he expresses it, by the use of " machineries!" He out-Owens Owen himself, and bids fair if he can get his machineries into operation, to be the greatest benefactor of his race. He shows in this neat little book, " that there are powers in nature, sufficient to effect in one year, more than hitherto all men on earth could do in many thousands of years, and that those powers may be applied to all human labor," and he moreover shows " the system of establishments for it," without any prospect of taking out a patent, but for the mere pleasure of benefitting his fellow men.

That we may not be accused of misinterpreting our erudite author, we quote his own programme first, and shall then proceed briefly to his mode of operating:

" *Fellow-men!*—" I promise to show the means for creating a paradise within ten years, where every thing desirable for human life may be had for every man in superabundance, without labor, without pay; where the whole face of nature is changed into the most beautiful form of which it be capable; where man may live in the most magnificent palaces, in all imaginable refinement of luxury, in the most delightful gardens; where he may accomplish, without his labor, in one year more than hitherto could be done in thousands of years; he may level mountains, sink valleys, create lakes, drain lakes and swamps, intersect every where the land with beautiful canals, with roads for transporting heavy loads of many thousand tons and for travelling 1000 miles in 24 hours; he may cover the ocean with floating islands, moveable in any desired direction with immense power and celerity, in perfect security and in all comforts and luxury, bearing gardens, palaces, with thousands of families, provided with rivulets of sweet water; he may explore the interior of the globe, travel from pole to pole in a fortnight; he may provide himself with means unheard of yet, for increasing his knowledge of the world, and so his intelligence; he may lead a life of continual happiness, of enjoyment unknown yet, he may free himself from almost all the evils that afflict mankind, except death, and even put death far beyond the common period of human life, and finally render it less afflicting; mankind may thus live in, and enjoy a new world far superior to our present, and raise themselves to a far higher scale of beings."

And now for the means:—

" The powers are chiefly to be derived 1) from wind, 2) from the tide, or the rise and fall of the ocean caused by the gravity between the moon and the ocean, and 3) from the sun-shine, or the heat of the sun, by which water may be transformed into steam, whose expansive power is to operate upon machineries, though by a contrivance different from that actually in use.

The waves of the ocean are also powers to be applied, but as they are caused by wind, they are included in the power of wind. Each of these powers requires no consumption of materials, but nothing but the materials for the construction of the machineries.

I shall begin with *agriculture.*

The first object is here to clear the ground from all spontaneous growth and stones.

1) A machine of large size is to move along, and while moving, to take the trees of all sizes with their roots out of the ground, to cut them in convenient pieces, to pile them up, and to take all stones out of the ground to any required depth.

2) A second machine is to follow, for taking up the piles of wood and stones, and transporting the same to the places of their destination; this machine may carry thousands of tons at once.

3) The wood removed to its places for final use, is then to be formed into planks, boards, beams, rails, pieces for fuel and for any other purpose, by a simple contrivance, from whence it is to be removed to the places where it be wanted; this is done by one machine, which may also cut stones of any size.

4) The first mentioned machine, with a little alteration, is then to level the ground perfectly, in planing it, filling the excavations or taking off the elevations of ground until all is level. If the hills or valleys are considerable, the same machine cuts terraces, winding round them up to the top in elegant shapes.

The same machine may make any excavation or elevation, cut canals, ditches, ponds of any size and shape, raise dams, artificial level roads, walls and ramparts with ditches around fields as enclosures, with walks on their top, form walks and paths with elevated borders.

5) The same machine, with some other little alteration, is to give to the ground its final preparation for receiving the seed; it tills the ground, in tearing the soil up to any required depth, refining or mouldering the same, sifting all small roots and stones from it, and putting the seed into the ground in any way required.

6) The same machine may take good fertile ground from one place to some other, for covering at any required depth, poor soil with fertile soil of the best mixture.

7) The same machine, with a little addition, may reap any kind of grain or vegetable, thrash

the seed out in the same time, grind it to meal, or press it to oil, it may also cut or prepare any other vegetable for final use in the kitchen or bakery.

8) Another small machine may sink wells and mines to any required depth and in any direction, and take the contents of the same up to light, it may be in earth, rocks, swamps, or water."

Here is a most effective machine, which will demolish at one fell swoop, all the Yankee contrivances in the patent office in Washington; this notice, it is hoped, will prevent all our mechanics from incurring any expense hereafter, in taking out certificates of their inventions. The land machineries are to be moved by the wind and the "sunshine." The author says of "wind power,"

"In order to form an idea near the reality in nature, how much power of wind there may be at our disposal, we have to ascertain, by a deduction from experiences and observations, how large we may construct and expose surfaces to the effects of wind, and how close they may be brought together without intercepting the wind and diminishing its power materially. We know by experiences, that ships of the first rank carry sails 200 feet high. We may, therefore, equally on land oppose to the wind surfaces 200 feet high. Imagine a line of such surfaces 200 feet high, and a mile (or about 5,000 feet) long; the same would then contain 1,000,000 square feet. Suppose the surface intersects the direction of the wind in a right angle, by some contrivances, and receives consequently the full power of the wind at all times. The average power of wind being equal to one horse's upon every 100 square feet, the total power, this surface would receive, would then be equal to 1,000,000 divided by 100, or 10,000 horses' power. Allowing the power of 1 horse to be equal to that of 10 men, the power of 10,000 horses is equal to 100,000 men's. But as men cannot uninterruptedly work, and want about half of the time for sleep and repose, the same power would be equal to 200,000 men's. Imagine such another surface just behind or before the former at 1 mile's distance, parallel to the first and in the same circumstances. This second surface would then receive the same power of wind again as the first; for the distance being 25 times greater than their height, the one line could not intercept the wind from the other in any considerable degree, both lines would receive the full power of wind, as soon as the direction of it would deviate from the horizontal more than about 2 degrees. It may be easily observed, that the wind will generally strike the ground in a steeper direction, and therefore admit a closer approach of such parallel surfaces. That the wind strikes the ground obliquely is evident on the high sea. Else whence the disturbance and rise of the waves on it?—If the wind moved parallel to the ground, the surface of the sea could not be affected by it, and would remain smooth forever. But such is never the case. The least breeze ruffles the surface of the water. And it is too well known, to what size and powerful effects the waves may be raised by wind. Moreover, experiences in navigation teach, that vessels of the first rank sailing along a shore of about 200 feet high, trees, &c. included, at their windside, at a distance of one mile, will not suffer any considerable diminution of wind. Now, if we find the power of wind to be at the end of every mile equal to 200,000 men's power, and so for every mile in breadth; it follows, that every one square mile affords such a power. What an immense power! The most populous countries in the world contain in an average from 100 to 200 individuals on every square mile, of which hardly one half is able to work, or to be counted for full hands to work. But suppose even 100 full hands to work on one square mile, the power of wind within their places of habitation will be 2000 times greater. Yet we will get a more proper conception of this power, in extending this comparison over the whole globe. The surface of the whole globe is about 200,000,000 square miles. According to the foregoing statement of 200,000 men's power for every one square mile, the whole extent of the wind's power over the globe amounts to about 200,000,000 times 200,000, i. e. to 40,000,000,000 men's power. The number of all human individuals on earth will not exceed 1000,000,000, of which hardly the half may be counted for full hands to work, that is 500,000,000; consequently, the stated power of wind is 80,000 times greater than all men on earth could effect with their nerves, when the wind is used but to the height of 200 feet.

What a gigantic, awful power is this! 80,000 times greater than all men on earth could effect by the united exertions of their nerves!—at the least calculation. Suppose even one half should be lost by friction of the machineries, or more, we need not economise with such an immensity of power, let but one eighth of it be used, it would amount still to 10,000 times the power of all men on earth. But if 10,000 times more can be done in one year, consequently, can be effected as much as hitherto in 10,000 years!—to what awful grandeur may not the human race exalt themselves?"

One of his greatest conceptions is, that power may be stored up for future use. He says much on this subject, but we can only quote one specimen:—

"But the manner, which I shall state hereafter, to apply this power, is to make it operate only for collecting or storing up the power in a manner, and then to take out of this store of power, at any time, as much power for final operation upon the machineries as may be wanted for the intended purposes. The power stored up is to re-act, just as it may suit the purposes, and may do so long after the original power of wind has ceased. And though the wind should cease at intervals of many months, we may have by the same power, a uniform perpetual motion in a very simple way."

The whole sea is to be covered with floating islands, bearing palaces, and the inhabitants while they are sailing about "without motion like ships," are to catch fish by "machineries" to supply the land-lubbers without any cost whatever! but the great thing is, that these islands as they rise and fall with the tides, shall by means of levers, "build palaces," and so forth, for those on land, without giving them any trouble! and our author declares solemnly, "all such things *and many others*, which may seem now but extravagant fancies, require nothing but the raw material for their construction, and these are to be found in plenty." One machine island is certainly to sail to Europe, in four days. "The island may be covered with fertile soil in the highest cultivation, buildings, and every thing that men may want for their enjoyment and commodity. There will be no motion felt like on ships. May this idea," he continues, "be consi-

dered as a mere fancy or as something that only a remote posterity may live to see! No, it is within our reach, *within less than ten years.*" Beware, oh ye ship builders, how you invest your money in ships of the present construction!

"The powers of Philosophy
Can light on metaphysics bring;
Can touch on selenography,
And causes trace unto their spring."

The best part of this production, and by far the most potent of the author's "machineries," is his sunshine steam engine. The heat is to be generated on the Archimedes plan; looking glasses are to concentrate the rays of the sun, and being placed on pivots, when the engine once gets in motion, it will move them, so as to keep pace with the diurnal motion of that "planet." As an objection might, however, arise that they would not work in the night, or on rainy days, the author is beforehand with the incredulous, and has two remedies for such interruptions:

"1) By enveloping the boilers with stuffs that keep the heat the longest in themselves, for instance, a thick coat of red hot iron or other hot metal, enveloped in a thick coat of clay, loam, sand, or other earthern material. We might thus continue a heat sufficient to boil water for many hours after the sun had ceased to shine, without consuming any material.

2) By contriving a re-acting power, caused by the power of the steam, of which hereafter will be given the description, and by which many days, and even many months the power of steam, caused by sun-shine, may react at will, and thus be rendered perpetual, no matter how often or how long the sun-shine may be interrupted.

The interruption of sun-shine, in this application, is therefore immaterial."

There's "machineries" for you; in the language of Mr. Etzler, "to what awful grandeur may not the human race exalt themselves," and individuals, it would appear, may do like*wisely*. He sums up the sunshine business thus:—

"The power of steam is therefore subject to no limits, its requisites being sunshine, water, and solid stuffs for confining and applying the steam, of which there is no limit, no materials being consumed.

The generating of steam-power is not the only use to be made of burning mirrors; they may be applied also to various other purposes of great importance, as I shall show hereafter.

Have I asserted too much, when promising to show, that there are powers in nature million times greater than the whole human race is able to effect by their united efforts of nerves and sinews?"

In "part second" of the volume, he gives a description of things as they are "at present," and as they will be "by the new means." Our quotations here might be extended very beneficially, but the state of beatitude we are to enjoy in "ten years," is too delightful to promulgate extensively, without spoiling people for every day things as they now are. That children will grow up by the aid of "machineries," "most cleanly and beautifully dressed," is a consummation which will procure Mr. E. many female subscribers. We promise him half a dozen at once, and have no kind of question, that with a moderate exertion, we could fill a subscription paper as large as one of his land sails.

"The children grow up without trouble, in all the innocence, intelligence, cheerful and playful temper, natural to their age, with blooming health and countenance, *most cleanly and beautifully dressed*, and exhibiting thus to the eyes of their parents the lovely attributes of angels. This is no more than what the arrangements stated warrant.

Whatever is to be known of man, children may have learned at the age of 8—10 years, by mere beholding, handling, and examining the things exhibited to them in the palace and gardens, just with no more trouble, neither to the teacher nor to the children, than they learn now their mother-tongue.

Men have there an equal chance for learning. They will learn there in one year more than the most learned could learn in all his life. And there will be as much difference between the intellect of man in the new state and that of the present, as there is now between the most learned and the most ignorant.

The knowledges are made beneficial to the highest possible degree for every human being at once."

This valuable work closes with a petition to Congress, for aid in the commencement, and one to the President, in which he threatens to sell to the first bidder, European or American. It is to be apprehended, that the wisdom now in Washington, is too deeply engaged in politics, to see their true interests in this matter, and that if the daily papers do not soon take up the subject, the projected benefits to this country will be entirely lost.

FENCES—YELLOW LOCUST.

From the Genesee Farmer.

The farmers of western New-York, have often been exhorted to make provision for fencing their farms, when the timber suitable for that purpose, now standing on them, shall have been exhausted; but it is very evident that the subject has not received that attention which its importance demands. Several farms in my vicinity are without the materials to repair the fences, and the owners are purchasing rails; yet no measures have been taken to provide for the future.

When a country is first cleared, the crooked rail fence is perhaps the best that can be made; but when timber becomes scarce, and the stumps have mostly disappeared, it is time to supply the place of these unsightly fences with such as will occupy less ground, and be more pleasing to the eye.

The thorn, thorn locust, crab apple, &c. have been recommended for hedges, but I believe comparatively few farmers have attempted to cultivate either of them for that purpose. The thorn, although it answers well in the humid climate of Great Britain, is of slow growth here, and the beautiful hedges of that material which adorned the state of Delaware previous to the revolutionary war, have mostly perished. Judge Buel is a warm advocate of the three-thorned Acacia; but E. Hersy Derby states that after a fair trial, he found it not to answer the purpose. He recommends the American Buckthorn, which he says, at the age of three years, presented a sufficient fence.

Now, although I would not discourage any from attempting to raise hedges, yet having come to the conclusion that I can do better, I shall proceed to

point out the plan which it is my intention to pursue. I have procured seeds of the yellow locust, and shall (after scalding) put them in the ground as soon as it is fit to receive them. When one year old they should be cut near the ground, when a very straight and thrifty shoot will spring up, and at the age of two or three years they may be transplanted from the nursery to the field where they are to stand. I intend to cover with them five acres of light sandy soil, and expect at the end of six or eight years to have plenty of trees fit for posts.

The soil best adapted to the locust is a rich sandy loam, but they flourish remarkably on the poor sands of Cowneck, Long Island, where two hundred and fifty dollars have been paid by ship builders for the locust timber standing on an acre. Although a warm light soil suits them best, I am persuaded they would grow in any part of Western New-York, and attain a size in twelve or fourteen years, sufficiently large to make two to four posts. I had two growing in a stiff clay, either of which, at that age, would have made four good posts.

Attempts to cultivate them have been made, on a very extensive scale, in several towns on the Hudson; but I believe in almost every instance, the borer has destroyed the hopes of the farmer. In this country we are exempt from this evil. I have been conversant with the locust for more than twenty years, and I have never seen one in the western section injured by the borer.

The locust has the remarkable property, even when planted on the lightest sands, of introducing a fine sward. I have remarked this where I have seen it growing on the very poorest soils of Long Island, and have often heard others make the remark.

As an ornamental tree it is beautiful; and when in flower, perfumes the air for a considerable distance. But it should never be planted on the borders of fields designed for tillage, for the roots extend many yards, and wherever one is cut off by the plough, a young locust springs up. This propensity renders it very easy to spread it. It is said, that plant twenty at equal distances on an acre, and plough the field twice, at intervals of three or four years, and the number of trees will be altogether sufficient.

It is well known that locust is considered the most durable timber our country affords—for no other do ship builders pay so high a price, and in fence posts it is said to have stood 100 years. I have no doubt the time will come when it will bear transportation on the canal.

Almost any timber of our forests would answer for boards, and saw mills are found in every town. So that if every farmer will *now* turn his attention to the locust, he need not fear but that when his present fences have decayed, he will have the means to erect such as will take up the least possible ground, will not blow down, will be an ornament to his farm, and such as his children may enjoy after him.

ONTARIO.

IMPROVED SHORT HORNS.

From the Genesee Farmer.

Your valuable correspondent, "*Ulmus*," has introduced to the notice of your readers the subject of stock, in a way well calculated to elicit the views and opinions of those who have given their attention to this important branch of agricultural interest; and it will, I trust, not only awaken a more general attention and inquiry into the value of the respective breeds alluded to, but will lead to a closer examination, a nicer scrutiny, and a more minute investigation of their distinctive characteristics, pretensions and merits. These being well understood, the very *important* points of pedigree and descent will be more narrowly looked into, and the excellence of a *pure* and *improved* breed will not be estimated by results obtained from its coarser originals, its half breeds, or mongrels. Every red beast of the field will not claim descent from the elegant and beautiful "*Devon*"—every imported "Short Horn"—every ship's cow with a crumpled horn, will not be palmed off on us for an "*improved Short Horn*"—the vulgar looking overgrown Leicester will not pass as Bakewell sheep, neither will the Hampshire downs be mistaken for the more refined Southdown sheep. In these matters we have been long enough the dupes of our own ignorance; and when we have given them more of our attention, we shall hear less of disappointments, of animals possessing no purity of blood,—of mixed breeds and their immediate degeneracy, &c. for the fact is, we shall then depend on *full bred* animals only for the improvement of our native stock, selecting such as are of undoubted pedigree, possessing their good qualities and excellent forms by *inheritance;* and these points, thoroughly established by long descent, form the characteristics of a particular breed which will be assuredly transmitted to their progeny. It is this certainty of *inheritance* from *full bloods*, that renders them so incomparably more valuable to the breeder, than any lesser grade of the same blood—it is this admitted fact that induces men to hazard such large sums of money, as we daily see risked, on the unborn produce of high bred animals; and upon this same principle it was, that when I wished to purchase, from the celebrated breeder, N. Whitaker, the produce of "*Western Lady*," (one of the cows cited by Ulmus,) I found it had been previously engaged to Col. Powel; nor was it at all remarkable that Mr. Whitaker, after I had become acquainted with his herd, should send me, for my selection, the names of seventeen cows, and their time of calving, with the prices of their produce, which varied as much as though the respective merits of their parents had already been identified in their embryo progeny. Another circumstance brought to my notice the importance attached to pedigree, by the breeders of cattle in England: While attending the cattle show, at Otley, in the West Riding of Yorkshire, for the purpose of purchasing the best individuals I could obtain of the improved Durham short horns, I was offered the *prize heifer* of the day, for less than one half what I paid Mr. Whitaker of Greenholm for younger animals! The heifer, though very beautiful in herself, had but two crosses of the *improved* blood; her grand dam being a selected "short horn" cow, but not of the *improved* breed; therefore, those excellencies, which obtained for her the premium, were not considered sufficiently established in herself, to *secure* their *descent* to her offspring, and thus render her valuable to the breeder, who could obtain others of purer blood, nor was it of frequent occurrence that a minor grade should beat a full blood. The premium, for the best two year old

bull, was taken by an "*improved* Durham short horn," bred by Mr. Whitaker, (sired by his favorite bull "Frederick,") which I now have at Maple Grove. The importance I attach to pedigree, and the desire I have that it should be fully estimated by others, induces me to offer the following extract on the subject from the Rev. Henry Berry's Prize Essay, as found in "Hints for American Husbandmen," &c. He states:

"It is possible that a good male may beget a son equally good as himself in EXTERNALS, from an ill bred female, but it is certain that such son will prove comparatively an inferior stock getter, it being an established fact that animals BREED BACK in point of resemblance, and it is therefore considered necessary, for the object of improvements or to retain excellence, to have a pedigree as little dubious as possible, for several generations. So important indeed is this fact of correct descent, that many breeders, who have, from causes which it is difficult to ascertain, a well bred animal of defective form, venture to use him, relying on his blood, and experience no reason for regret that they have done so."

Having said thus much on the importance of pedigree, I will now remark, in reference to the "*improved* short horns," that no animal can be considered full bred, whose pedigree, *both* on the part of the *dam* and sire, is not to be traced *uninterruptedly* back to the "*Herd Book*," which has been in England carefully kept as a register of this breed of cattle, with all the exactness of the "stud book." In purchasing *such* cattle nothing need be said, nothing need be taken on trust,—the "Herd Book" is the best voucher of pedigree, and I would strongly recommend that a copy should be kept in the office of every agricultural journal as a book of reference, which would enable the editor to answer any and every inquiry on the subject of pedigree relative to the "*improved* Short Horns."

Short Horns are the prevailing breed of Flanders, part of Holland, and as far north as Holstein; and, from importations, are now the common stock of the north of England, under the various modifications of "Short Horns," "Teeswater," and "Durham" cattle. They were also imported into this country, under the appellation of *Dutch* cattle, and their descendants are common in the neighborhood of Hartford, and through the Connecticut valley; also along the borders of New Hampshire and Vermont, where they were introduced by Wm. Jarvis, Esq. "who after twenty years experience on the subject thinks they cannot be improved by any cross or any breed of cattle." E. Wolcott, Esq. a skilful and practical farmer of Connecticut, it seems, was not of the same opinion; for this gentleman, after purchasing a few heifers from Mr. Jarvis, travelled into Masschusetts, and there saw the imported bulls *Denton*, *Cælebs*, and *Admiral*, of the *improved* Short Horn breed, and their offspring: and then, in a letter addressed to the corresponding secretary of the Pennsylvania Agricultural Society, expresses himself fully persuaded of the superiority of these last, and purchased a young bull of the *improved* breed. It would appear, also, that the English breeders did not remain so well satisfied with their importations from Holland as to "continue to keep the blood distinct." In tracing the history of the improved Short Horns, we are led back nearly one hundred years, to the time of Sir Wm. St. Quintin, of Scampston, who resided in the north of England, and there introduced, from Holland, the cattle, which crossed with the best stocks of the country, possessed of the same characteristics, became distinguished as the "Teeswater Short Horns." That considerable attention to the improvement of this breed had been given, even at this early period, is evident, from the results of Mr. Milbank of Barningham, who slaughtered a five year old ox of this breed, weighing 2,110 lbs. the four quarters, and yielding 224 lbs. of tallow. A cow, also bred from his stock, slaughtered at twelve years old, weighed upwards of 1500 lbs.; and this cow was the daughter of the *old studly bull*, one of the most celebrated ancestors of the *improved* Short Horns. He was the grand sire of *Dalton Duke*, afterwards the property of Mr. Wetherill, a celebrated breeder of the *improved* Short Horns. Mr. Geo. Snowden, of early memory, also obtained from Sir Wm. St. Quintin's stock, six cows and a bull, from which he bred *Snowden's bull*, the sire of *Hubbock*, another noted ancestor of the *improved* breed. It will now be sufficient to say, that in Mr. C. Colling's bull *Foljambe*, the Barningham and Hubbock's blood were united, and that this bull was the grandsire of *Comet*, the most celebrated animal in the "Herd Book;" to which we refer those who would wish to fill up, more particularly, the skeleton, here traced from the Rev. H. Berry's pamphlet on the subject. He further says—"from the time of Mr. Milbank to the period when Mr. C. Colling commenced breeding, it appears, then, that considerable care had been bestowed on the Teeswater cattle," the originals of the *improved* Short Horns; and the records, since, most amply proved their continued and improving excellence. Again the Rev. H. Berry observes:

"It is on testimony unimpeachable and experience most matured, that the animals, respecting which particulars have been given, were in themselves extremely good, ripe in points, possessing fine symmetry, and light offal. Surely it is justifiable to conclude the originals of the *improved* Short Horns were long deservedly celebrated as a valuable stock; that therefore their descendants *are not* a breed, as to excellence, of *yesterday*, liable and likely to *degenerate to-morrow;* but that they possess the important advantage of being descended from a long line of animals in which existed, in an eminent degree, the good points which are admired in themselves."

Being an admirer of the *improved* Short Horns, I have endeavored to set them apart and alone, in contradistinction to the whole Short Horn family, and its various and mixed varieties, and as a separate breed, not coming at all within the remarks cited by "Ulmus," as objections, and valid ones too, against "short horn Durham bulls." I could almost imagine the writer of the quoted paragraph, had made his selection of a bull, from a batch of Short Horns, manufactured in Connecticut for the western market, which I saw parading the streets of Albany, (some eighteen months since) in a long and ludicrous procession; they looked the very burlesque of pedigree—and yet, they found purchasers! R.

LEGISLATIVE AID TO AGRICULTURE.

From the Newark Daily Advertiser.

The proposition introduced in the New York Legislature, to found an experimental school of

agriculture, under the auspices of the state, is well conceived, and we hope it may be acted upon. In this age of general improvement, when institutions and associations have been formed for promoting intelligence in almost every branch of knowledge, and among all classes, we see no good reason why measures should not be taken, for extending similar advantages to the cultivators of the soil. At least five sixths of our whole population are maintained by husbandry and gardening; it is therefore of the first consequence, that instruction should be universally disseminated on all the branches of tillage. This would enable the proprietors of the soil to manage it in such a manner as to insure the most abundant harvests, as well as to afford the greatest possible enjoyment to their households, from the variety, value and beauty of their products. A powerful impulse should be given to this great branch of national industry: it is required by public policy, patriotism, and a just regard to the rights and interests of the people. And it is greatly desirable that the state governments should take measures to facilitate inquiries and experiments. As a science and an art, agriculture embraces a wide field, requiring an extensive acquaintance with natural history and philosophy, while the practical operations are so various, difficult, and oftentimes even delicate, that they cannot be satisfactorily performed without intelligence. Theory and practice must be taught, and science and skill acquired in a contemporaneous manner; and this can only be done in well managed schools of instruction, combined with farms of experiment, under well educated and practical masters. We can never have the advantage of improved cultivation, combining ornament and recreation, with utility and comfort, without them. The genius of husbandry must be sought by advances, propitiated by kindness, and her protection insured by assiduous devotion.

The French people, in the exercise of that munificent spirit which has rendered Paris the emporium of the arts and sciences, the seat of useful knowledge and elegant learning, have endowed seminaries dedicated to all the different branches of rural economy. The Jardin des plants, the school of rural economy at Alfort, and the celebrated farm of Rambouillet, would do honor to any country. Why then should we hesitate to commence the foundation of similar establishments. The inducements are more urgent, the demands as imperious, and prospective advantages incalculable. We should feel dishonored as a nation, that no institutions have been founded for the advancement of an art which includes so much; which administers to our wants, and multiplies the sources of our happiness. This reprehensible indifference—this total negligence of measures for inculcating theoretical knowledge and practical skill, in a fundamental department of human education is inexcusable, and demands the serious consideration of the people. There are means enough and to spare.

USEFULNESS OF THE STRAW CUTTER.

From the New England Farmer.

The following letter gives conclusive testimony, in addition to many proofs we have heretofore published, of the value of the important implement here named.

Beverly, Jan. 25, 1834.

It is with pleasure that I comply with your request, asking the result of my experience on the subject of feeding stock. My stock consists of 51 head, viz. 8 horses, 6 oxen, 35 cows and 2 yearlings. This stock was fed in the usual way with English, salt and fresh meadow hay, with meal and potatoes as their condition required, to the 1st December last, at which time I commenced chopping my hay. In giving the result of my experiment I must in some measure ask the privilege of a yankee, viz. that of guessing; but in this case I think I can guess pretty correctly, as much of the hay as has been loaded in consequence of having to remove it from one barn to the other, and calculating the number of days a load would last, the result is as follows:

700 lbs. English hay, at $16 per ton,	$5,60
200 " fresh " 4 "	40
100 " salt " 8 "	40
3 bushels corn meal,	2,25
8 " long red potatoes,	1,60
Per day,	$10,25
400 lbs. English hay chopped, $16 per ton,	3,20
100 " fresh " " 4 "	20
100 " salt " " 8 "	40
3 bushels corn meal,	2,25
4 " long red potatoes chopped,	80
140 gallons pure water,	0,00
1 man at $3 per month,	31
Board of man at $1,50 per week,	23
Per day,	$7,39

Balance in favor of straw cutter, $2,86 per day.

In addition to the above balance, may be added an increase of six gallons of milk from twenty-five cows then in milk, and likewise something for the improvement of the condition of my whole stock.

Yours respectfully, AMOS SHELDEN.

NEW METHOD OF APPLYING STEAM POWER.

From the Keeseville Argus.

Mr. Brown, of Keeseville, has stated that he has invented a plan by which he proposes to dispense altogether with the use of an engine, thereby not only saving the important item of fifteen thousand dollars in the expense, but moreover the cumbrous bulk and ponderous transportation of an engine. He has entire confidence in the perfection and utility of this discovery, having tried the experiment "on a small scale;" and is taking measures to patent his invention, and to demonstrate its capacity early the coming season. Mr. Brown is an ingenious mechanic and worthy citizen of our village. Thus, with Burden's boat, Rutter's process of generating steam, and Brown's application of its power, we may soon expect to ride from Troy to New York, and back in *twelve* hours, and at an expense less than we could stay at home in "these hard times."

A FAT HOG.

From the Richmond Whig.

Mr. Samuel Cottrill in the upper end of Henrico, killed a hog of his own raising on Friday last, the nett weight of which was nine hundred and fifteen pounds.

STUMP EXTRACTORS.

From the Northampton Courier.

The Genesee Farmer, a few weeks since, made inquiries about the operation of Stump Extractors, and wished for information respecting them. A correspondent who has seen them in operation, furnishes us with the following particulars:

"The common method and that with which I have been longest acquainted, consists in a perpendicular lever from eighteen to twenty four feet long, (according to the size of the stump to be removed.) One end of the lever is made fast to a large root of the stump as near as possible to the trunk; the highest part of the stump is next fastened to the lever at a point which becomes the fulcrum. The power is then applied by a long and heavy chain to the end which is in the air, and thus the stump is easily torn from the earth. Two yoke of oxen will remove a stump of the common or middling size without difficulty: but the earth must be previously removed from around the stump, and some or all of the roots must be cut away with the axe.

Another and better method is the *horizontal* lever, one end of which is fastened to a root of the stump and to its trunk, (others say to a neighboring stump where there are many in a field,) the power is then applied to the remote end of the lever, and the stump at the opposite end, or the stump which is used as a fulcrum, must give way, more commonly the former. A small wheel is advantageously placed under the end where the power is applied; causing it to run over the ground more easily than otherwise. By this method two yoke of oxen and three men may easily remove about forty stumps in a day, if they are of hard wood, and somewhat old, (in which case little or no digging will be necessary,) or perhaps twenty green stumps of hemlock, pines, &c.

The last and best stump machine I have seen or heard of consists in a *wheel and axle*. A large but simple frame is supported by two upright posts within the frame, and upon the uprights an axle is made to revolve by a wooden wheel of some ten or twelve feet circumference, with a strong chain passing around its periphery. Two yoke of oxen will turn the wheel, and thus another chain fastened to the axle and to the stump under the machine is wound around the axle until the stump is torn from the earth. The machine though light is somewhat unwieldy; but the difficulty of transporting it from one stump to another might be removed by affixing wheels to it, and this would in no wise interfere with the operation of the machine. It is difficult to say how many stumps might be pulled in a day in this manner, for such computation would be influenced by a variety of circumstances, such as the character and size of the stumps, the nature of the soil, &c.; but many hundred acres of the New England territory have been cleared by this machine at the rate of ten dollars the acre; and in some instances large tracts of land which were once thickly wooded, have been rendered stumpless for the small sum of eight dollars the acre, every stump exceeding six inches in diameter, being removed."

GOOSEBERRY CATERPILLAR.

Watering with lime water, always when the sun shone strongly, effectually destroys them, without injuring the leaves.

REMARKABLE PLANTS.

From the last Westminster Review—Murray's Physiology of Plants.

Large Leaves.

In the foliage of plants, there is a vast diversity in superficial extent, as well as thickness. There are leaves of microscopic minuteness; and others of immense size. Some species of coltsfoot are of considerable magnitude; and leaves of the rheum palmatum, have been found to measure five feet in their longest extent, by three feet in their greatest breadth. These, though remarkable for this climate, sink into insignificance in comparison with tropical foliage; the leaves of the danœa elliptica measure, in many instances, not less than six feet in length, and nearly eighteen inches in diameter in their widest part. The leaves of the strelitza regina grow to the height of three or four feet by eighteen inches, and sometimes leaves of this plant will be found still larger. The leaf of the musa paradisiaca, or plantain, has been found to measure more than ten feet in length, by two feet at the base. Some leaves of palms far exceed even these dimensions. A leaf of the corypha umbraculifera, or great fan palm, or talipot tree, sometimes measures five and thirty feet in circumference, a sufficient covert for thirty or forty men. The rafia palm of Madagascar is said to measure sixty feet. A frond of the ciboa palm serves the natives of Africa as an umbrella, and thus protected Mungo Park from the tropical rains. In the South Sea Islands, the leaf of the talipot palm serves as a parasol, as it does the purpose of an umbrella in the East Indies. At Manilla, one of the Philippine Islands, a Jesuit missionary had a dwelling constructed for him under two palm leaves, where he said mass, and slept secure; it was a complete covert from the storm, and no rain could penetrate. In consistency also, the fronds or leaves are very various: airy like gossamer, or the texture of the most delicate film, up to the coriaceous mass of the Nopal, or the thick succulent leaves of some mesembryanthemums, and the rigid ones of the agave. The leaves of the paliscourea rigida, large, tough, and unyielding, rustle like parchment in the wind; and the cactus spinosissimus, and some yuccas and agaves, might form a stockade or circumvallation, which would defy an enemy with all the armory of war. Indeed, we once remember to have seen, near to Orbitello, in Italy, a field, of which the agave americana was the entire fence, and a most impenetrable barrier it seemed to be.

Leaves are sometimes beautifully polished, and shine like ivory. The begonia nitida has leaves which possess a beautiful lustre: the magnolia, the holly, and the laurel have leaves that seem to be varnished. Each leaf of the double cocoa nut is twenty feet long and ten feet wide. Sometimes the leaf is silky, or satiny, resembling the pericarp of honesty. The silver tree, protea argentea, presents a beautiful example of a shining satiny leaf; some leaves are so clothed with down as to resemble white velvet: the *verbascum thapsus*, or great mullein, is a familiar instance of a thick woolly covering for the surface of the leaf. Sometimes this satiny or woolly integument may be stripped off entire, a process which is managed with considerable dexterity by the natives of the south of Africa; the stalks and leaves thus treated, supply stockings, gloves and caps. According to Hum-

boldt, caps are formed of the spathes of certain palms, which possess a coarse net-like tissue. The inner bark of cerra duida, or shirt trees, supplies the Indians with garments resembling sackcloth.

The Largest Flowers.

Among the most extraordinary discoveries of modern times, fertile as our era has already been in the fruits of research is that of the rafflesia arnoldi; discovered in the year 1818 by Dr. Arnold: its generic name is a very just compliment to the late Sir Stamford Raffles, and the specific name to that of its discoverer. Plate I. figure 5, represents this extraordinary parasite found in the Island of Sumatra. The circumference of the fully expanded flower is *nine feet*, being a yard in diameter. The nectarium was computed to hold twelve pints; and the entire weight to be fifteen pounds. The petals or segments, which are five in number, are about twelve inches long, and vary from one fourth to three fourths of an inch thick. The color of these petals is a brick red, covered with yellowish white protuberances. I have seen a fine wax model of this magnificent titan of the vegetable kingdom, in the rooms of the London Horticultural Society; and there are buds in the Linnean Society's Museum; the flower fully blown was discovered in a jungle under some bushes, close to the ground, with a swarm of flies hovering over the nectarium, and apparently depositing their ova in its substance; the late Dr. Arnold thus announces its discovery in a letter to a friend: "At Pulo Lebban, on the Manna river, I rejoice to tell you, I met with what I consider the greatest prodigy of the vegetable world. I had ventured some way before the party, when one of the Malay servants came running to me, with wonder in his eyes, and said, "*Come with me, sir, come! a flower very large, beautiful, wonderful!*" I went with the man about a hundred yards into the jungle, and he pointed to a flower growing close to the ground, under the bushes, which was truly astonishing. My first impulse was to cut it up and carry it to the hut: I therefore seized the Malay's parang, (a sort of instrument like a woodman's chopping hook,) and finding that it sprang from a small root, which ran horizontally, (about as large as two fingers,) I soon detached it, and removed it to our hut. To tell you the truth, had I been alone, and had there been no witnesses, I should, I think, have been fearful of mentioning the dimensions of this flower, so much does it exceed every flower I have ever seen or heard of; but I had Sir Stamford and Lady Raffles with me, and Mr. Palsgrave, who, though equally astonished with myself, yet are able to testify as to the truth.

"The whole flower was of a very thick substance; the petals and nectary being in few places less than a quarter of an inch thick, and in some places three quarters of an inch: the substance of it was very succulent. When I first saw it, a swarm of flies were hovering over the mouth of the nectary, and apparently laying their eggs in the substance of it. It had precisely the smell of tainted beef.

"Now for the dimensions, which are the most astonishing part of the flower. It measured *a full yard across;* the petals being twelve inches high, and a foot apart from each other. The nectarium, in the opinion of us all, would hold twelve pints; and the weight of this prodigy we calculated to be fifteen pounds!"

Locomotive Powers of Seeds.

The forms of seeds are very curious, and infinitely diversified: some are like a horn, a crescent, a shield, or a horse shoe; others resemble a snail (medicago,) or a caterpillar (scorpiurus)—others again, will be found like a shuttlecock, as the cyamus; all these forms, we reasonably conclude have their design—"nothing cometh by chance." These peculiarities in structure are connected with their preservation, their dispersion, their insertion into the soil, and the depth to which they penetrate, as well as their mode of germination. The feather grass, stipa pennata, is plumed like an arrow, which will preserve the seed in a particular direction; and as soon as it darts down upon the earth, it worms or screws itself into the soil, to a certain depth; when the plume, having fulfilled its office, breaks off, flies away, and becomes the sport of the winds. Though this be a very singular phenomenon, the shuttlecock seeds of the thistle and dandelion afford examples of contrivances of a somewhat similar kind. The seeds of the tillansia, or wild pine of the West Indies, a parasite on other plants, are supplied with long threads, which have the property of coiling themselves round the branches of trees, and thus become fixed, until the seeds germinate. Many seeds are remarkably susceptible of moisture. The seeds of the musk cranesbill are connected with an apparatus which unscrews itself when moist, and coils itself up again, when dry. When these seeds are moistened, they begin to move, and the minute hairs serve as feet to direct their movements. When the bearded oat is left for some time undisturbed in the barn, along with other grain, it is found to have escaped from the husks, and crept to a distance from its former attachment. The grains of equisetum sylvaticum, when placed on a table, and viewed through a lens, present an appearance like insect motion, and may be seen to leap over an intervening object. If we shake a frond, for instance, of the horse tail fern over damped paper; when examined by a lens, the minute seeds will appear to crawl about like so many spiders. Thus the application of the awn of the wild oat for the purpose of hygrometry, and the still more sensible Indian grass, employed in Captain Kater's ingenious and beautiful instrument. The peculiar inclination in the inequalities of surface in the awn of barley will prevent its retrogression, while its expansion by moisture will impel it forward from the spot where it originally fell: its march onward, therefore, will be incessant from moisture, and it will merely pause in its progress, when that moisture exhales. Mr. Edgeworth constructed an automaton figure on the principle of the animated oat, which, in a few weeks, walked across the room. The screwlike structure of the bearded oat is very apparent, resembling in some measure the remarkable stem of the screw pine, which is perhaps designed to serve a somewhat similar purpose in its relations to moisture: if we breathe on the seed, the awn, which is a little elevated above the plane of the horizon, will be put in motion, and describe the segment of a circle. When the avena fatua, or mad oat, is therefore moistened, it writhes like a being possessing life; of this description is the seed of the geranium cicu-

tarium, and others. The seed vessel of the didymo carpus rexii, which is twisted up in the form of a spiral coil, unwinds with moisture, and drops its seeds under circumstances favorable to their germination. The microscope reveals some extraordinary phenomena of this kind; and Mr. J. E. Bowman pointed out to me some singularities in minute cryptogamous seeds, which, when affected by moisture, and seen under the microscope, appear all life and motion, particularly the trichia and sphærobolus, where, from a point invisible to the unaided eye, the seed vessel voluntarily expands, and rolls forth its millions of globes, as indeed its name in Greek implies.

The dispersion of seeds also supplies us with a chain of curious contrivances, admirably suited to the purposes for which they are designed; and it is a subject of regret, that these singularly constructed species of mechanism, have not been so minutely investigated, as the interesting subject merits; well might Forskal say, "*miro, nec ad huc investigato mechanismo propelluntur semina.*" The capsule of the violet will project its contained seeds to a distance of several feet; and the elastic arillus of the wood sorrel, will eject them over a considerably greater space. The euphorbia coccum, (Gærtner,) is also remarkable in this respect, as well as some of the ferns, which possess an elastic ring for the purpose; geranium, fraxinella, and others. The crackling of the capsules of furze in a warm summer day, must be familiar to many, and is sometimes the only sound which breaks the stillness of the landscape. The scales which enclose the seeds of pines sometimes open suddenly, and disperse their contents. The noise occasioned by this mechanical impulse on the air may be often heard at a considerable distance: "This crackling voice," says Mr. Keith, "was observed and traced to a fir tree, namely, pinus pinea, at Kendlesham parsonage, on July 14, 1808, by two young gentlemen, my pupils, who thought the tree was bewitched, till the cause of the noise was pointed out to them." A species of wild cress, cardamine impatiens, suddenly unfolds its seed vessel on being touched. I have, when handling the plant, and more minutely examining the structure and elastic apparatus of the seed vessels, been temporarily deprived of vision, by the impulsion of the seeds into my face. The balsam, balsaminum, is not less curious than the rest of these, and has been not inappositely, from the elastic force employed by the seed pod in the dispersion of its contents, called "touch-me-not." In these cases, the power of the projectile seems to reside in the elasticity of the valves of the capsule.

Luminous Property of Certain Plants.

In the case of the rizomorphæ there can be no mistake. These curious plants are found in subterranean cellars and mines, and illuminate the darkness which surrounds them with their magic light. In some of the coal mines of Dresden, they are singularly beautiful and brilliant. Mr. James Ryan informed me he was once accidentally shut up in a mine, and the light of one of the rhizomorphæ was so brilliant that he could distinctly see to read a letter by it. As the rhizomorphæ prey on dead wood, they impart to it a phosphorescent light. The rhizomorpha phosphoresces is found in the mines of Hesse, and yields light in the dark, but ceases to be phosphorescent in hydrogen and some other gasses: the rhizomorpha subterranea and aidula have also been found to illuminate the mine with their fairy light. Mr. Erdmann thus describes the luminous appearance of the rhizomorphæ in one of the mines of Dresden. "I saw the luminous plants here in wonderful beauty; the impression produced by the spectacle I shall never forget. It appeared, on descending into the mine as if I were entering an enchanted castle. The abundance of these plants was so great, that the roof, the walls, and the pillars, were entirely covered with them, and the beautiful light they cast around almost dazzled the eye. The light they give out is like faint moonshine, so that two persons, near each other, could readily distinguish one another. The light appears to be most considerable when the temperature of the mines is comparatively high." That the light is electric seems most probable, when we consider that an electric discharge imparts phosphorescence to Canton's phosphorous, (calcined shells,) and that heat enhances the light.

PECULIAR FORMATION OF THE NEGRO STOMACH.

From Travels in Egypt.

"I had frequently observed," says Mr. Madden, "that the exhibition of an emetic to the negro soldiers was often attended with convulsions, and even death: on further inquiry I found that these remedies invariably produce distressing effects on all the black people of *Dougola* and *Sennaar*. On examining the body, I found the stomach different from that organ in white people, both in size and structure. As this difference has not been noticed hitherto, I am free to acknowledge, that the appearance I observed, might be the consequence of disease, and not its natural state; but as I remarked the same especial difference in three cases, I think I am warranted in the supposition that the smallness of the negroes' stomachs, and the peculiar corrugation of their folds, are no less distinct marks of that race, (insomuch as physical organization is concerned,) than their thick craniums and prominent cheek bones. The vulgar notion of "thick headed" persons being obstinate, is founded in truth. But the peculiarity to which I alluded was this, the stomach was below the ordinary size of that organ in Europeans, and its internal surface resembled in some degree a turtle's throat, from the extent of its corrugations. I discovered likewise, a difference in the skeleton, in two of these cases, each having six vertebræ of the loins, instead of five, and on examining the spines of many living negroes, I find the occurrence of six lumbar vertebræ very frequent. This accounts for the extraordinary length of the lumbar part of the back in so many negroes. That they are a distinct race I think is evident from these, and other peculiarities."

ALIMENTARY TUBERCLE OF VAN DIEMAN'S LAND.

From the Asiatic Journal.

A singular substance has been found at the depth of a foot, or a foot and a half, in the earth of that country. It has not yet been described, but is called *indigenous bread.* It is covered with a thin skin, has a rounded form, like a potato, or yam, and is sometimes as large as a man's head. When cut, it appears to be composed of a solid

spongy mass, containing a considerable quantity of alimentary matter. No root or fibre has been found adhering to it, so that sometimes it has been thought to be a sort of terrestrial polypus, possessing a principle of animal life. The only indication of its presence which the natives have, is the occurrence of an exceedingly small leaf, which rises from the earth, and is connected with it by very thin and delicate fibres, which break whenever the tubercle is raised.

[A substance (called the *Tuckahoe*) which agrees with the foregoing description in most respects, is found in this part of Virginia. It is generally ploughed up on lands which have not long been cleared of their original forest growth; and this substance is supposed to be a fungus, or excrescence, from the dying root of some tree. No leaves, or other products of vegetation are known to proceed from the Tuckahoe.]

ON RAINING TREES.

By John Murray, Esq. F. S. A. F. L. S. F. G. S. &c.

From the Magazine of Natural History.

The secretions of trees form a curious part of their physiology, but the influence of vegetation on the atmosphere seems to have been entirely overlooked, at least as far as it regards its meteorology.

In the case of that curious genus of plants, the Sarracen*ia*, in which the S. adunca is most conspicuous, the foliaceous pouch is a mere reservoir, or cistern, to catch and retain the falling dew or rain. In the *N*epenthes distillatoria, or pitcher plant, the case is different; and analysis proves it to be an evident secretion from the plant itself, independent altogether of the fact that it is found in the pitcher before the lid has yet opened. I may here state, *en passant*, that the results I obtained from a chemical examination of this liquid, differ materially from those of Dr. Edward Turner. The *C*ornus mascula is very remarkable for the amount of fluid matter which evolves from its leaves, and the willow and poplar, when grouped more especially, exhibit the phenomenon in the form of a gentle shower. Prince Maximilian, in his *Travels in the Brazils*, informs us that the natives in these districts are well acquainted with the peculiar property of those hollow leaves that act as recipients of the condensed vapors of the atmosphere; and, doubtless, these are sources where many tropical animals, as well as the wandering savage, sate their thirst "in a weary land." The Tillandsi*a* exhibits a watery feature of a different complexion: here the entire interior is charged with such a supply of liquid, that, when cut, it affords a copious and refreshing beverage to man. That these extraordinary sources of "living springs of water" are not unknown to inferior creation, is a fact interestingly confirmed to us in the happy incidents detailed by Mr. Campbell, in his *Travels in South Africa*, where a species of mouse is described to us, as storing up supplies of water contained in the berries of particular plants: and in Ceylon, animals of the Simia tribe are said to be well acquainted with the Nepenthes distillatoria, and to have frequent recourse to its pitcher. The mechanism of the "rose of Jericho" (Anastatica hierochuntina) shows the susceptibility of plants to moisture in a very remarkable manner; and I have submitted some experiments made with this extraordinary exotic, the inhabitant of an arid sandy soil, to the Horticultural Society of London. That succulents should be found clothing in patches the surface of the burning desert is a phenomenon not the least wonderful in the geographical history of vegetation.

In Cockburn's *Voyages* we find an interesting account of a tree in South America, which yielded a plentiful supply of water by a kind of distillatory process: this tree was met with near the mountainous district of Vera Paz. The party were attracted to it from a distance, the ground appearing wet around it; and the peculiarity was the more striking, as no rain had fallen for six months previous. "At last," says he, "to our great astonishment, as well as joy, we saw water dropping, or, as it were, distilling fast from the end of every leaf of this wonderful tree; at least it was so with us, who had been laboring four days through extreme heat without receiving the least moisture, and were now almost expiring for want of it" The testimony of travellers is too often enshrined among the fabulous; and their credentials either altogether rejected by some or at least received "cum grano salis." Bruce of Kinnaird forms the most remarkable example of this kind, and the caricature of Baron Munchausen consigned the whole to sarcasm and ridicule; and yet the time is come when the more remarkable circumstances and phenomena mentioned by this traveller, verified by Lord Valentia, Mr. Salt, &c., are received as well accredited facts. The curious phenomenon mentioned by Cockburn finds an interesting and beautiful counterpart in two plants; namely, the Calla æthiopica and Agapanthus umbellatus, in both of which, after a copious watering, the water will be seen to drop from the tips of the leaves; a phenomenon, as far as I know, not hitherto recorded.

The great rivers of the continent of Europe have their source of supply in the glaciers; but many of the rivers in the new world owe their origin to the extensive forests of America, and their destruction might dry up many a rivulet, and thus again convert the luxuriant valley into an arid and sterile waste; carried farther, the principle extends to the great features of the globe. What the glaciers effect among the higher regions of the Alps, the *P*inus *Cembra* and *L*arix communis accomplish at lower elevations; and many a mountain rivulet owes its existence to their influence. It rains often in the woodlands when it rains nowhere else; and it is thus that trees and woods modify the hygrometic character of a country: and I doubt not but, by a judicious disposal of trees of particular kinds, many lands now parched up with drought, as, for example, in some of the Leeward Islands, might be reclaimed from that sterility to which they are unhappily doomed.

In Glass's *History of the Canary Islands* we have the description of a peculiar tree in the Island of Hierro, which is the means of supplying the inhabitants, man as well as inferior animals, with water; an island which, but for this marvellous adjunct, would be uninhabitable and abandoned. The tree is called *Til* by the people of the island, and has attached to it the epithet *garse*, or *sacred*. It is situated on the top of a rock terminating the district called *Tigulatre*, which leads from the shore. A cloud of vapor, which seems to rise from the

sea, is impelled towards it; and being condensed by the foliage of the tree, the rain falls into a large tank, from which it is measured out by individuals set apart for that purpose by the authorities of the island.

In confirmation of a circumstance *prima facie* so incredible, I have here to record a phenomenon, witnessed by myself, equally extraordinary. I had frequently observed in avenues of trees, that the entire ground engrossed by their shady foliage was completely saturated with moisture; and that during the prevalence of a fog, when the ground without their pale was completely parched, the wet which fell from their branches more resembled a gentle shower than any thing else; and in investigating the phenomenon which I am disposed to consider entirely *electrical*, I think the *elm* exhibits this feature more remarkably than any other tree of the forest. I never, however, was more astonished than I was in the month of September last, on witnessing a very striking example of this description. I had taken an early walk, on the road leading from Stafford to Lichfield: a dense fog prevailed, but the road was dry and dusty, while it was quite otherwise with the line of a few *Lombardy poplars;* for from them it rained so plentifully, and so fast, that any of them might have been used as an admirable shower bath, and the constant stream of water supplied by the aggregate would (had it been directed into a proper channel) have been found quite sufficient to turn an ordinary mill.

EXPERIMENTS ON MANURES.

Extract from the Southern Planter.

The question is not where to find manure—it is every where; but how to dispose of the force of the farm to the best advantage in collecting that which is most valuable with the least labor. It would be as absurd to undertake to tell a man what occupation would insure a fortune without receiving any attention, as to point out to a planter where he will get abundant supplies of manure without labor. Any occupation is a fortune in time, with care and attention; and manure is every where, if we employ the time and labor necessary to collect it. The important fact to know, is that animal excretions are the essence of manure; whatever can be mixed with them will have a manuring quality imparted to them without diminishing their quality to manure.

But there is one source of manure as inexhaustible as the water of the ocean, always at hand, and more valuable than the mines of Peru, that as yet passes little noticed and seldom employed. We have only to properly ascertain its value and bring it into general use, and we will never be at a loss for materials to manure with. Manure will always be at hand more than we want. The objects will be to learn how to economize in the time and labor necessary to collect it, and the most judicious mode of employing it then will receive consideration another time. We will at this time pass on to make some observations on this never to be exhausted source of manure, which each and every planter has at command as abundant and inexhaustible as he could desire—this is red clay.

A pint of blood was taken from my arm. I had it poured round a stalk of young corn; the plant soon sickened and died. A few days after I was bled another pint. This blood I had well mixed in about a half bushel of tolerably dry red clay, taken from a tree root that had been blown down many years ago. This when well mixed was suffered to remain so several days, and one half of it was applied to a corn stalk; the other half had as much clay added to it, well mixed, and allowed to remain a few days, when one half was again applied to a young stalk of corn; the other half was again mixed with as much more clay, and used as before; so I continued it until applied to six stalks; the last stalk, therefore, had one half bushel of clay, and 1-64 of a pint of blood; yet when the corn was all grown I could not perceive much difference. They were all good, the last being little the best. It was, however, latest, and the late rains were best. My conclusion was, the one was about as well manured as the other. Several holes were made where the hills of corn were to grow. About a week before planting I put in one about a peck of strong unrotted manure from my stable; another peck of manure was mixed with about a bushel of dry red clay—one half of which was put in the next hole; the remainder was again mixed with the same quantity of clay, and used as before, until the six holes were manured; the last hole, therefore, had a bushel of red clay, and 1-64 of a peck of horse manure; they were all planted. The year was dry. The stalk that had only horse manure pined and made little corn. Of the other six there was little difference. In both these experiments, rows of unmanured corn were on both sides of the manured rows, and the difference was very great.

I had two little stables in which I kept my saddle horses, one in each stable. Both of these stables I occasionally had filled with stalks, straws, leaves, &c. as near equal as I could make it; but in one I would every now and then have a load of clay thrown. I had two little pens made, in which the manure was put when the stables were emptied. The stable which had clay, I thought had perhaps twice as much as the other. When it was taken out, a hole was dug down to the red clay, a layer of manure was put in, then a layer of clay, and so continued, so that one pen, on a rough estimation, contained three-fourths clay and one-fourth manure; the other pen all manure. Planting time, three pieces of rows of drilled corn and cotton were used for the experiment. The ridges being opened, the furrows were well manured, one of each with fresh dug clay, one of each with the clay and manure mixed, and one of each with the manure alone. Of the cotton, I could not perceive that the clay alone did either good or harm. Of the corn, it did decided injury. Of the cotton, the clay and manure was beautiful; of the corn, equally so. Of the cotton, the manure alone was, I thought, a *little* the best; of the corn, the manure alone was worst of all. It pined and looked like it would die at one time. It was very dry; late rains however brought it out, and although it did not look well, yet the ears were large, and perhaps it made as much as the other.

Now, do not these experiments, if correct, prove that animal excretions are the essence, if we may so call it, of manure? That any quantity of vegetable matter, when mixed with them, acquires a new quality of manuring from them, and that when we have put as much vegetable matter as we can get or as we choose, that it will all become as ani-

mal manure, and to this mass of manure we may heap on red clay without taking any thing away. We are, therefore, to consider animal excretions as the real manuring principle, which can impart its quality to any quantity of vegetable matter with which it may be mixed, and this again can impart its qualities to any quantity of clay with which it may be mixed; or comparatively speaking, animal excretions to the manure heap may be considered as yest to the grain; a little of which with sufficient labor and time, would ferment all the grain on earth, and yet the whole would contain as much fermenting principle as the first yest had; or as the small piece of glass of antimony which could make emetic wine of all wine that has been made since old father Noah took it too freely, and yet have just as much emetic quality as before. It is not however contended, that animal excretions are the only manuring principles.

R. R. H.

ON THE PETRIFYING OF WOOD, AS APPLICABLE TO TIMBER FOR RAILROADS, &c.

From the American Railroad Journal.

Some time since, in an eastern paper, their appeared an article stating that some person had discovered a method of completely petrifying wood, and so preserving it nearly, or quite indestructible, by saturation with *hydrate of lime*. If any of your correspondents can furnish any information of the process; or any facts which may elucidate the subject, perhaps they might render an important service to the cause of railroads, in situations which require or admit the use of wood; and I would respectfully suggest to any who may recollect such facts, that the communication of them to the Railroad Journal would be a gratification to at least *one* of its readers—probably to many.

It is said that timber imbedded in lime, under certain circumstances, as, for instance, the ends of beams inserted in the walls of brick houses, decays sooner than in the open air—becomes dry rotten, &c. I have heard it argued that this is owing to the causticity, or some other quality of the lime; and to prevent the effect, it has been a practice, in some cases, to leave a space for the ends of the beams, large enough for the free circulation of air around them, and free from contact with the lime used in the construction of the walls. Whether the facts observed in these cases fully justify the conclusion that time is always, or ever, injurious to the durability of the timber, I would not venture to assert, and it is not my purpose now to inquire. I am willing to admit the conclusion that it *may* be so in some cases; but I would suggest the inquiry whether its causticity may not be so completely destroyed by saturation with water, and in this state whether wood may not be so far impregnated with it as to become much more durable, and perhaps next to indestructible.

The notice mentioned at the introduction of this article, if it may be relied on as fact, answers the inquiry in the affirmative. Of the fact, however, I am ignorant, and therefore it is that I make this communication and inquiry. My object is to excite others to further investigations, and with this end in veiw, I beg leave to state some facts of which I have been informed, which seem to me to prove sufficiently, that lime may, in *some* situations, be made to contribute very essentially to the durability of wood; and, perhaps, may suggest a remedy, to some important extent, for the disadvantages to which wooden railroads are obviously liable.

Some years ago, I was travelling on the seacoast of Maine, and put up for a night at the house of an elderly gentleman, who had been all his days concerned in ship-building and navigation, and appeared to be a sensible, shrewd observer. He had that day, a new vessel arrived from her first voyage to a foreign port, and among other circumtances was told that she had not leaked a *drop* during the voyage. This led me to remark that she must have been exceedingly well built. He replied that he thought the tightness of the vessel was owing, in a measure, to the *lime* with which she had been stuffed while building. He had been led to believe that lime was a better preservative of the timber of ships than salt, or any other substance heretofore used for that purpose. While this vessel was being built, and before ceiling up the inside, he had the interstices of the timbers filled with new stone lime, pounded fine enough to be driven in between the timbers, and rammed in as solid as was possible in that state; the planking was then finished, and the lime left to slake and fill the remaining interstices. His theory was, that the air, and the moisture of the wood, and perhaps a little water, which might be expected to leak into the best built vessel, would slake the lime so that its expansion would fill every chink in the timbers, and penetrate the pores of the wood itself, sufficiently to prevent speedy decay; but any effect in rendering the vessel more staunch he had not anticipated. He, however, concluded that the expansion of the lime, though, from its small quantity, not sufficient to injure the vessel by its mechanical force, yet had been sufficient, by the addition of the little water which had leaked in, to form a mass of mortar so solid as to prevent, at least in some degree, the further ingress of water from without. This, however, was a new idea, and the present experiment was not conclusive; but as to its effect in preserving the timber, he had no doubt; and he related several facts in his own knowledge in support of this opinion.

As one instance, he stated that he had once owned a coasting vessel, built of the common timber of the coast of Maine, which, when nearly new, was once bound from Thomaston to Boston, with a cargo of lime, and on her passage went ashore somewhere between Cape Ann and Boston, and bilged. The lime slaked, burnt the deck and upper works, and, as might be expected, penetrated the timbers throughout. The vessel was unloaded repaired, and lived, I think he said, thirty or forty years after this event; had undergone occasional repairs since, but the principal part of the original timber remained. When, after that that time, examined, it was found that the original timbers, which had been impregnated with the lime, were perfectly sound, while those which had been added since that time, were all, or nearly all, rotten. He adduced, also, the fact that vessels employed in carrying lime, generally, if not always, last longer than any others; and said that he had resolved thereafter to saturate, as far as possible, all his vessels with lime, as the best method of preserving them from decay.

Another instance was that of a parcel of pine planks which had been used as a platform, on the ground, on which to make lime mortar. This

platform was laid by his grandfather, in a corner of the yard, and used more or less every year for the purpose of a "mortar bed." His father continued it in the same use; himself, the grandson, continued it for a time, as long as he had occasion; after which, it lay some some years unused, and overgrown with grass and weeds; at length, wanting the ground for another purpose, he had it torn up and removed, expecting to find the planks entirely rotten—but, to his surprize, found them sound, and, to use his forcible expression, "as hard as a bull's horn." This was after they had lain in contact with the surface of the ground, exposed to all the vicissitudes of the atmosphere, I think he said, *about sixty years!*

It is now near 15 years since I received these accounts from the old gentleman, and I have never seen him since: my recollection, therefore, may not be perfectly accurate in the details of his statements, but of their *substance* I feel certain. When I saw the notice referred to in the beginning of this article, respecting the preservation of timber by means of hydrate of lime, these facts at once recurred forcibly to my mind, and I was led to the inference that, in the cases mentioned, there had been so much water present as to destroy the *caustic* properties of the lime, convert it to a *hydrate*, and hold so much of it in solution, and in such a situation, as that it might always be presented to the wood for its absorption, until it had become entirely saturated, and the wood thus effectually preserved.

Will some of your correspondents recollect, and furnish for publication in the Journal, such facts as may confirm or correct this inference, and trace out its legitimate consequences if confirmed?

G.

To the Editor of the American Railroad Journal.

SIR—I am induced to communicate a fact corroborative of the opinion of your correspondent G. in the 3d number of the 3d volume of your Journal, that lime is a preserver of timber. Some fifteen years ago a friend of mine removed a decayed mill trunk in order to replace it with a new one. The trunk had been laid under ground, and when it was covered with earth, a few scattered lumps of lime were accidentally thrown upon it. On its removal, it was discovered that every part of the wood which was in contact with lime was as perfectly sound as it was when it was first laid, whilst every other part was more or less decayed. Indeed, those parts exhibited a freshness and soundness which were truly remarkable.

XENOPHON.

CULTURE OF HEMP.

By Leonard E. Lathrop, Esq.

From Goodsell's Farmer.

Some farmers, well informed in the business of practical agriculture, are of the opinion that hemp may ultimately become one of the most important and valuable exports from the interior of New-England, as well as the western and southern States; and that it is as natural and valuable a staple, and every way adapted to our climate and soil, as cotton is to the climate and soil of the south. Some of them say that it will produce more pounds to the acre than cotton, and with much less manual labor; and will command in market, if properly prepared and handled, a price as great as the short stapled cottons, by the pound. And to induce our northern farmers to engage in it, it has been observed, that before the introduction of cotton into the interior of the Carolinas and Georgia, corn and provisions were, as they now are among us, a mere drug, utterly unconvertible into cash, even at a very low price; and that, as the introduction of cotton there, raised the demand and the price, and made a ready market for grain, so that of raising hemp may in New-England and the western States.

Could the introduction of hemp become the means of diverting, in some measure, the market of rye and corn from the distilleries, those engines of corruption, disease and misery, it certainly would be a valuable improvement to the condition of our country.

We now purchase great quantities of Russian hemp at enormous prices, for the calls of our commerce and naval establishments, because we have not it is said, sufficient that is fit for use.

Our surplus rye and corn now go to the retailing merchant, a great proportion of it, and from the merchant to the distiller. But if hemp were introduced as one of the staples of our agricultural system, the growers of it would be in a condition to purchase much of the grain which is now sold for foreign merchandize, and to pay cash for it, which would better promote the interest of those who cultivate it.

As the culture of this plant has not been much attended to in the northern States, the following remarks, by a writer who appears to have been a practical farmer, are worthy of consideration:—

"This plant flourishes most in a mellow, dry soil,* and the richer the better. It affords little or no profit on lands of ordinary fertility. In soils naturally adapted to its culture, or in those sufficiently manured, it is one of the surest and most profitable crops, as the plant is subject to no disease, nor is it liable to be annoyed by any insect. Droughts do not sensibly affect its growth, and it is in no danger of being destroyed by cattle.

From two to three bushels of seed are requisite to the acre, proportioned to the fertility of the soil, as in other crops.

The seed must be of the year next preceding, as it quickly loses its germinative powers.

A ton of hemp when dressed, may be raised from two acres of land, of the highest fertility.

It is believed that in this crop, as in almost every other, material benefit is to be derived from soaking the seed, in a solution, not too strong, of common salt, or salt petre, or in a moderate ley of wood ashes, and then rolling the seed in gypsum, before sowing. The application of gypsum, as manure, after the seed is sown, is also beneficial, if the soil is suitable.

The ground should be harrowed before the seed is sown, as by that means the seed may be sown of a more even depth, that it may all start together; otherwise a part of the plants will outgrow and keep down the rest.

It should be sown as early in the spring as the

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* The editors of the Agricultural Encyclopedia, however, say that the soils most suited to the culture of this plant, are those of the deep, black-putrid, vegetable kind, that are low, and rather inclined to moisture, as well as those of the deep, mellow, loamy or sandy descriptions; and that the quantity of produce is generally much greater on the former than on the latter, but it said to be greatly inferior in quality.

ground can be put in proper order and sufficiently dry. In ordinary seasons in New-England, it will be ripe for harvest about the first of August, the time for harvesting being indicated by the falling of the flowers, and withering of the leaves.

The male plants of hemp bear the flowers, and the female plants the seed. A sufficiency of the latter are to be left for seed, and those will require about six weeks further time to ripen, the ripeness being known by the seed turning brown.

The seeds may be gently beat off the stalks when dried, or they may be taken off by a coarse comb, made for the purpose.

It is said the female hemp which has stood to ripen the seeds, requires a longer time to rot, than the male, and when dressed is harsher. It has been advised to sow some hemp thinly by itself for seed, and then the rest of the crop may be pulled or cut together. In grounds that are smooth the crop is cut close to the earth, by a kind of scythe, made for the purpose. The usual practice, however, is to pull it in the manner of pulling flax.

When it is sufficiently dried, which in good weather will be in about one week, it is to be gathered in bundles, bound with straw, and then carefully stacked up so as to be kept in a dry situation.

Many farmers practice rotting it in the winter by spreading it on the snow, in the early part of winter, so that by being covered with other snows it will be bleached and improved in its color.—When the snows dissolve in March, it will be found sufficiently rotted.

When sufficiently dry, it should be first broken with a coarse break, and then with the common flax break; and dressed in the manner of flax, but more gently, as it will waste with hard beating.

The crop may also be rotted in the fall, in a manner similar to that of rotting flax; or, it may be water-rotted like that crop. When water-rotted, the hemp should be sunk completely under the water; and if it be stagnant, the hemp should be turned upside down, when about half rotted, otherwise from the greater degree of heat on the surface of such waters than below, the upper part will be rotted before the under.

By water or winter rotting the coat of the hemp blacken much less than when rotted in the fall: and it is observed, that the warmer the weather, or the earlier in the fall the crop is rotted, the blacker the coat will be, as is the casea lso with regard to flax.

The crop of hemp should be harvested as soon as it is fit for the purpose; otherwise the male stalks will soon wither and blacken; after which the coat is of little value.

Hemp may be made a substitute for flax, for all common purposes. But in that case it is said it must be softened by steaming it over boiling water or ley, and beating it after it is dried again.

An excellent crop of wheat has been taken after a crop of hemp, and with very little expense.

The policy of introducing any new crop, to constitute a staple for market, should be adopted with caution. It has been remarked, that it might raise the price of grain, as did the introduction of cotton in the southern States; but is it certain that a ready market and high price for grain, are indiçative of the most prosperous condition of a country? It is not certain that a majority of the citizens of any country would always be ready to give an affirmative answer to this question. The great question respecting the policy of raising our own hemp for commercial and naval purposes, rather than purchase it of foreigners, must depend on the effect it would have on the price of labor. A very large portion of our citizens, who constitute an important part of the strength of our country, purchase their bread corn, for which they have to pay in their services only. The price of those services is not always enhanced in proportion to that of grain or butcher's meat. It should be a predominant object in the policy of our country, not to attempt the advancement of its general interests by means, which in their operation, tend to depress the condition of the poorer class of citizens.

TOBACCO.

From the Farmville Chronicle.

Mr. Editor—It is believed by many, that a system of lock and dam navigation can be adopted upon the Appomattox river, from Farmville to Petersburg, which will reduce the freight to one half or perhaps much less than one half, the present freight. It is probable that a leading object of the meeting to take place in Farmville on the 21st inst. will be to turn its attention, mainly, to the subject of adopting some plan for employing a practical and experienced engineer, to examine and survey the river, and to make an accurate estimate of the cost of the work. Should it be found that it can be executed at a cost within the reach of the country interested, and which would leave ample room for profitable dividends to the stockholders, nothing can be plainer than the great importance of executing such a public work, with all convenient despatch.

The boats which would probably be used for navigating the river, upon this plan, would carry from 30 to 50 tons burthen; and perhaps be propelled, or towed, by steam power: and if so, the trip down and up can be easily performed every two to three days at all seasons of the year; and if so, who can calculate the immense advantages which would result to this part of the State?

To say that the commerce of this river, would very soon be doubled, would not only be modest, but, I think, very far below the mark, even supposing a coal trade to Petersburg should not be added to the articles of trade heretofore carried upon this river. But it is exceedingly probable, that an extensive coal trade would be opened, as coal, of the very finest quality, has been discovered, in a number of situations near Farmville, and there appears to be no reason to doubt, that any quantity can be raised, within a few hundred yards of the river; and if so, the tonnage trade of this article alone, as well as the tolls thereon, may greatly exceed the whole of the present trade.

In order to enable those who take an interest in this subject, to form some opinion of the practicability of such a navigation, and the probable dividends to stockholders, I will give a rough estimate of the probable amount of stock which will necessarily be created and expended, and the probable amount of annual tolls, water rents, &c., predicated upon an increase of commerce far below what, I have no doubt, it would be, independently of any calculations of a coal trade, as well as many other articles, which would, no doubt, be carried upon this river, in addition to those which now constitute the trade between Farmville and Petersburg. Should a company be formed to construct such a

navigation, the stock of the present Appomattox company, would, necessarily, have to be purchased by the new company, by giving them a certain amount of stock, bearing a certain and specified interest.

The original cost of the present stock of the company, was $61,000, and this is something like as much as the present market value of it ; but it is intrinsically worth considerably more. Supposing, then, this stock be worth one-third more, say $82,000, bearing an interest of 6 per cent. The fall in the river from Farmville to Petersburg, or to the canal, is ascertained, by actual measurement, to be only about 150 feet; to overcome which, 25 dams and locks, of 6 feet lift, would be necessary. I have obtained some calculations from a stone mason, of great practical knowledge, in which he estimates each dam and lock to cost $2250, made of good solid masonry. But suppose it should be as high as $3,000 each ; this would be $75,000. Suppose the widening and deepening of the present canal at Petersburg to cost $5,000 average for each mile ; this would be $35,000; and that the enlarging the locks cost $20,000 ; then the old company's stock, and the cost of constructing the new mode of navigation, taken together, would be $212,000. The interest on this sum would be $12,720 annually, and consequently, the tolls and water rents should at least yield this sum to justify such an expenditure.

The present nett income of the present Appomattox Company, is about $5,000 annually. If the tariff of tolls was doubled, it would be about $10,000, and if the commerce should only double, then the nett income would be $20,000 annually, instead of $12,720—the sum necessary to pay 6 per cent, annually, upon the old stock purchased, and the new expenditure. If, as a probable consequence of such a navigation from Farmville to Petersburg, a rail road should be constructed to Staunton river, there can be no doubt but the commerce would increase four-fold, instead of doubling ; and if to this circumstance, we suppose an extensive coal trade may open from Farmville to Petersburg, we may fairly suppose the incomes of the company might reach $30, to $40,000, or more, annually, instead of $20,000. And if to all this, we take into calculation the necessary improvement in the agricultural interests of this part of the country, and the great probability, that real estate would, as a natural consequence, advance 50 per cent. in value, surely this scheme of navigation presents considerations abundantly sufficient to induce us to take measures to have the work accurately measured, and correctly estimated.

A FARMER.

TOBACCO.

From the Farmville Chronicle.

This great staple of that part of Virginia which lies south of the James river, has been improving in its management during the last ten years. The curing especially has come near to perfection, compared to former years, but there is still great want of correct information among the planters *generally*, with regard to the proper order and condition for pressing. They have, perhaps, been misled by publications on the subject, and advice from dealers in the article, which were intended for some particular kind, yet not proper for all kinds. The following opinions are the result of many years experience as a dealer in the article of tobacco, and may be taken for what they are worth. The British markets consume, annually, about 12,000 hhds. of tobacco, principally Virginia. Tobacco, to suit these markets, must be put up in the dryest order possible, or as dry as it can be without breaking the leaf; a duty of 3*s*. sterling per pound paid by the consumer, makes dry condition indispensable in these markets. The French market consumes about 4,000 hhds. of Virginia tobacco—to suit that market, the dry order is not necessary. Suitable quality, and order, dry enough to keep sweet through the sweat, is all that is required—this fact being generally known, a portion of the crop much larger in amount than the quantity wanting for France is put up in order, entirely unsuitable for the British markets, (which are our best markets) and is sold without the competition of the British buyers to the shippers to France, or is sold for a low price to be stemmed or reprized in dry order for the British markets. Now, it is well known to shippers of tobacco, that *fine rich* tobacco, put up in order, dry enough for England, will answer the demands of the French market. The clear inference is, that all fine, rich tobacco, ought to be put up in dry order, that it may suit the demands of either market. It is a well known fact, that during the past season, much fine tobacco has been sold low on account of its soft condition, which if dry, would have sold high for the British markets.

A MERCHANT.

BRITISH FARMING CAPITAL.

From the Genesee Farmer.

The expense of stocking a farm of 150 acres, and the necessary outlay for one year, is estimated in one of the latest British publications, at £1450 9*s*. 6*d*. ($6440) of which half a year's rent forms an item of £112 10*s*. and the poor rates another item of £20 or $88,80. In the Quarterly Journal of Agriculture, the expense of estimating and carrying on a farm of 500 acres, for one year, is estimated at £3569 17*s*. 11*d*. ($15,849) the rent of which is put down at £1000. Of the 500 acres, 100 are supposed to be in fallow, turnips and potatoes, 100 under wheat and barley, 100 oats, 100 grass seeds, and 100 year old grass. With these heavy charges, to which the expense of American farming bears but a small proportion, British farmers live and grow wealthy. The rent, tithes and poor rates are an enormous drawback in England of which we have but very little experimental knowledge. The rent in the first case noted is about $7, and the poor rates 75 cents per acre. In the latter case the rent is about $9 per acre. The only manure charged in the latter estimate (the rest being made upon the farm) is 640 bushels of *bone dust*, at 2*s*. 6*d*. per bushel, or 80*l*. ($355). The expense of cultivating an acre of the several crops is estimated as follows: turnips, 5*l*. 10*s*. 2*d*. ; barley, 4*l*. 14*s* 7*d*. ; clover 2*l*. 11*s*. 10*d* ; wheat, 5*l*. 13*s*. ; beans, 5*l*. 2*s*. 9*d*. ; oats, 4*l*. 7*s*. 7*d*. These amounts include rents, tithes, rates and taxes upon the land occupied by the several crops. In dollars they amount to a charge of ten to twenty-four per acre. It will be perceived, that the 500 acre farm is under alternate husbandry—there being no grass of more than one year old.

BRITISH FARM STOCK.

From the Genesee Farmer.

The improvement of British farm stock, has been strikingly evidenced in the records of Smithfield market. In 1730, the average weight of the fat cattle sold there, was estimated, by Davenant and others, at only 370 lbs. exclusive of offal, or hide and tallow; of calves at 50 lbs. and of sheep and lambs, taken promiscuously, at 28 lbs. It is estimated that the present average weight of cattle (1833) is 656 lbs. excluding offal, of calves 144 lbs., and of sheep and lambs 90 lbs. Thus the average weight has been nearly doubled in the last hundred years. These data will enable us to judge of the susceptibility of improving our own stock. This branch of the London provision market is thus stated for 1830, not including the dead meat brought in.

		Av'ge w't.	No. of pounds.
Cattle,	159,907	656	104,898,992
Sheep,	1,287,070	90	115,836,300
Pigs,	254,672	96	24,448,512
Calves,	22,500	144	3,240,000

The gross amount of butcher's meat, averaged among the population of the city, gives to each individual 170 lbs. per year, or more than half a pound per diem, exclusive of bacon, hams, fish and poultry. The consumption in Paris, of like meat, is estimated at 80 lbs. and in Brussels at 89 lbs. per annum, by each individual.

THE UNDULATING RAILWAY.

From the American Railroad Journal.

For the purpose of further testing this important principle, several experiments have been tried since our last publication, of which the subjoined is the result:

It was determined by the engineers who witnessed the last experiments, that another trial should be made to prove the possibility or otherwise of conveying on an undulating line double the load which the engine was capable of drawing at a like velocity on the horizontal railway.

The only day on which it was thought this experiment could safely and satisfactorily be made was on a Sunday; in consequence of which, on Sunday week a train of loaded carriages, weighing 150 tons, exclusive of the two engines which moved them and their tenders, left Manchester for the Sutton inclined plane.

On this occasion it may, in truth, be said that there never was a more friendly assemblage of mechanical men. It is well known to some of our readers that the French Government have selected a body of the most eminent engineers in that country to visit England, with a view of acquiring all requisite information preparatory to the construction of the intended French lines of railway. These gentlemen, nine in number, were all present; the English engineers who attended being Mr. Robert Stephenson, senior; the Messrs. Daglish, Mr. Dixon, and Mr. Badnall, in addition to whom were nearly all the practical mechanics connected with the railway, and many others, (among whom was Mr. Case, of Summerhill, and Mr. Garnett, of Manchester,) who felt a deep interest in the result.

The following statement is an undeniable corroboration of the favorable opinion which we have before expressed on this subject.

Mr. Badnall had proposed, as an extreme test of the merits of the undulating principle, that a double load should be attached to the engine, which he was of opinion could be moved with facility, and with one engine on a curve; and it cannot fail to be interesting to the world at large to know that the experiments fully proved that his opinion on this subject was correct. The following explanation will verify our meaning:

Experiment 1. Two engines, the Firefly and the Pluto, brought the whole train of wagons, (the length of the train was about 151 yards,) weighing 150 tons, exclusive of engines and tenders, to a given point at the foot of the Sutton inclined plane, the velocity attained at this point being about 19 miles per hour. The Pluto then left the train and the Firefly ascended with the load 575 yards in 116 seconds; the distance traversed by the two engines to generate the velocity before ascending being at least one mile.

Exp. 2. The power of the Firefly being reversed, the engine and load *descended* 575 *yards* in 74 *seconds;* the velocity attained at the foot of the plane being *far greater* than at the same point when *ascending.*

Exp. 3. The Firefly and Pluto having traversed 1 mile to generate a velocity of 15 miles an hour, and the Pluto then leaving the train, at the foot of the inclined plane, the Firefly and load ascended 315 yards in 90 seconds.

Exp. 4. The Firefly's power being reversed, the whole train descended 315 yards in 65 seconds.

Exp. 5. The same engines and load, working about 1¼ miles, attained a velocity of 18 miles an hour; the Pluto left as before, and the Firefly and load rose 457½ yards in 102½ seconds.

Exp. 6. The Firefly and train descended 457½ yards in 80 seconds.

N. B.—On this occasion some delay occurred in reversing the power, which will account for the comparative difference in time.

Exp. 7. The two engines, as before, attained a velocity of 18 *miles* an hour at the foot of the ascent; the Pluto then left the train, and the Firefly shut off her steam; the whole train then rose *by momentum only*, 332 yards in 70 seconds.

Exp. 8. The train descended (the Firefly working) 323 yards in 66 seconds.

The preceding experiments undoubtedly prove two most important facts, not only that a locomotive engine can convey, on an undulating line, double the load which it is capable of conveying at the same velocity on a level, *but that it can accomplish* this by the employment of *only one half its power*, which last mentioned fact was decided by the last experiment.

LEGISLATIVE AID TO AGRICULTURE.

From the Genesee Farmer.

It has given me much sastisfaction to observe the spirit with which the citizens of Erie county have come forward in the cause of Agriculture; and that New York and Albany again have Agricultural Societies. Nothing is wanting to produce a similar result in Cayuga county, but a few influential individuals to call the friends of such an institution together.

A great question is now before the public, and it will probably soon be brought before the Legislature—that is, ought the state to patronize *agricultural societies*, and endow an *agricultural school*. I regret that it has been made a question at all, for it ought to be answered unhesitatingly in the affir-

mative; and I hope that the Legislature will only debate about the best mode of applying the sum asked for. I could no sooner doubt the utility of the measure, than I could the judicious application of manure to arable land. The valuable effects of both would be soon visible; and the consequent *increase* of the canal tolls from the western counties would probably reimburse every expenditure.

The state of New York has been liberal in its appropriations to Colleges; and the sons of farmers have doubtless shared largely in the benefits; but most if not all of these were designed for other professions. We want an institution where farmers sons can be educated *farmers*. Where they can learn the sciences connected with agriculture, and practice on those principles with their own hands. The best modes of farming, with order, regularity, and neatness would soon become to them, a second nature; and if properly selected from *all* the counties, they would on returning home, extend the knowedge thus acquired into every corner of the state.

But a *pattern farm* would be an object of extraordinary interest; and a visit to it, would be worth a journey of several days. Three pattern farms would be very desirable: one in the *southern*, one in the *eastern*, and one in the *western*, parts of the state. To proceed cautiously however, one near Albany or Utica might be best for a beginning; and if this met the reasonable expectations of the public, the number would be soon increased.

I conclude this hasty sketch with earnestly requesting the friends of agriculture to exert themselves; and to have petitions circulating in every neighborhood. It may be regretted that more printed copies have not been distributed; but this deficiency may be obviated by making fair copies of that recommended by John P. Beekman, or by adapting that proposed in Erie county to the circumstances and situation of the petitioners. It may be found at page 375.

DAVID THOMAS.

Greatfield, Cayuga co. 12 *mo.* 5, 1833.

MR. CARTER'S CULTIVATION OF A PREMIUM CROP OF POTATOES.

To the Committee on Experiments and Agricultural Products:

Gentlemen:—In offering a statement of the cultivation and product of one acre of potatoes for the premium offered by the trustees of the agricultural society, I deem it proper in conformity to their rules to state that the sward was broken in Dec. 1832 (having the summer previous taken from the same about $1\frac{1}{2}$ tons English hay)—in the spring of 1833 cross ploughed—then carted on 40 buck loads or about 16 cords of rich animal manure, spread and ploughed in the same, and about the first of June after the field had been furrowed $2\frac{1}{2}$ feet apart, the seed (consisting of $\frac{2}{3}$ds long reds, $\frac{1}{3}$d blues, 55 bushels) was planted—when the plants were all out of the ground the field received a first dressing—second ditto when the plants were 1 foot in height. The crop harvested 1st November, which was by correct measurement, 677 bushels on one acre. WILLIAM CARTER.

Fitchburg, November 27, 1833.

I certify that I assisted in digging and measuring the whole crop of potatoes mentioned above, and that the amount was as there stated, six hundred and seventy-seven bushels.

JOHN STICKNEY.

Worcester, ss November 27, 1833.

Then appeared the above named William Carter and John Stickney, and severally made oath that the above statements and certificates by them severally subscribed are true.

Before me,

EBENEZER TORREY, *Just. Peace.*

This is to certify that I, Philip F. Cowdin, being sworn surveyor in the town of Fitchburg in the county of Worcester, having measured a piece of ground on which potatoes grew this season, and find it to contain one acre and no more, the land of Wm. Carter of Fitchburg, and cultivated by himself. PHILIP F. COWDIN.

Fitchburg, November 20, 1833.

[We have received some of the latest British periodical publications on agriculture, and have made such arrangements as will furnish a regular supply of the future numbers, as soon as possible, after they issue from the press. The necessary facilities for this purpose are now provided by the newly established line of fast sailing packet ships, between James river and Liverpool. Some selections from this new source will be presented in this number. Similar arrangements have been made to obtain some of the best agricultural periodicals from France and Germany, and the first importation is expected very soon. No expense will be spared to furnish the readers of the Farmers' Register, with the latest and best information from these sources, although the proportion of matter in these works worth selection and republication here, may be expected to form a very small part of the whole mass purchased.]

RESULTS OF CROSSING THE IMPROVED SHORT-HORNED AND DEVON CATTLE, *by C. H. Bolton, Esq.*

From the British Farmers' Magazine.

Sir,—In the 27th No. of your valuable Magazine, when giving an account of my two years old steer, you also gave an extract from my letter on the advantages attendant on crossing cows of different breeds with improved short-horn bulls, and in confirmation of this opinion, (not hastily adopted, but the result of several years practical experience, and a close attention to the experiments of several friends during the last seventeen years,) I send you the portrait and a short account of a two years old Durham and Devon heifer of mine, lately slaughtered by Mr. Wm. Danniel, of Abergavenny, and accompany it with a few brief statements of the advantages derived from this system by several of my own personal friends.

This heifer was the second cross, and was of a light grey color. She weighed 35 scores and 8lbs; rough fat, 98lbs. She was allowed to be the fattest and best beast of her age, in all points, ever seen in Abergavenny. She had a dead calf about six weeks before Christmas; was dried the 17th of January, and killed the 10th of June. She sold for 19*l.* 3*s.* 6*d.*

Her live weight,	8th of June, was	1232lbs.
Ditto	17th January,	840
	Increase in 140 days	392

Being aware that strong prejudice and much incredulity existed on the subject of crossing, I courted the attention of all the respectable farmers, breeders, and feeders, in this neighborhood; many came to see her when first put up, and repeatedly afterwards during the five months she was feeding, and they all concurred in saying, she went on faster than any beast they had ever seen. She never had any oil cake.

I have seen many excellent beasts bred from *improved* short-horn bulls and long-horn cows; indeed I never knew any one of these bulls put to any cow where the produce was not superior to the dam. But the cross which I advocate, and with which I am best acquainted, is that with the Devon cow. I have uniformly remarked, that each succeeding cross was attended with a proportionate improvement in size, quality of flesh, and aptitude to fatten; in every instance they have shown themselves superior milkers, and stand to the pail till within six or eight weeks of calving, and several instances have come under my own knowledge where they have never been dry since they first calved. And so highly are they prized as milkers, that a friend of mine, who hired out dairies, informed me, that the dairymen gave him nearly 2*l.* per cow, per year, more, for the half and three-quarter breds, than they would give for cows of any other breed.

A friend of mine had about a dozen North Devon cows, small in size, but nice in quality, and from these he commenced, about twenty years since, breeding with short-horn bulls. He has since invariably used those bulls. With each succeeding cross, the stock have rapidly improved in every essential, and the only trace of the Devons which I could perceive when I last saw them about two years since, was a peculiar richness in their coloring. He breeds about thirty annually, and generally sells his three years olds in the autumn, at from 17*l.* to 22*l.*; and I have known him sell in-calf heifers to jobbers, in fairs, as high as thirty guineas each. All his stock are superior milkers. Here we have twenty years' experiment, and continued improvement. Within the last eight years I have sent many North Devon heifers to Ireland, to friends residing in different counties, and some of them occupying land of very inferior quality. I also sent over two young Durham bulls, from the stock of the Rev. Henry Berry, to cross them with. They have all crossed them with short-horn bulls at my recommendation, and the accounts they give are most satisfactory. They say the two years old, half-breds, are as good as the three years old Devons, and are all good milkers. One of these bulls, by Mr. Berry's Mynheer,* has been four times exhibited in three different counties, and has each time taken the first prize. He was last year sold for sixty guineas, and is now serving cows at 1*l.* each.

If any testimony were wanting to corroborate the statement in No. 26 of your Magazine, of the benefit to be derived from Mr. Knight's method of cultivating potatoes, I should be happy to add mine. I have for several years been in the habit of planting the entire potato, and making the rows three feet six inches apart, and have found this plan always succeed. I give them raw to my cattle; to fatting beasts about 40lbs. per day, with hay; to store beasts, about half that quantity, with straw; and to my milking cows, I allow 24lbs daily, with hay. I have given them steamed, but found the cattle did not do well after them when put to grass. After the raw ones, they thrive rapidly on grass.

I am, sir, your's, very obediently,

C. H. BOLTON.

Brynderry, Abergavenny,
June 30th, 1833.

* Mynheer is a full brother to the cow whose portrait is given in this No.

GREEN CROPPING.

Extract from the British Farmers' Register.

"There is another, and, I conceive, a most important subject, which I am anxious to bring under the notice of the committee, I mean *green cropping*, and the propriety of holding out encouragement to the practice of it. Agriculture is divided into three great branches—*green cropping*, *white cropping*, and *stock management*, and they are mutually and severally dependant for success on each other. Without green cropping we cannot raise weighty crops of grain, and without great crops of grain, and consequently of straw to be used as litter and partly as fodder in conjunction with the green food for feeding stock through the winter months,* we cannot make dung; and without plenty of dung we cannot raise green crops, and so on; and it is such a disposition of stock and crop, as shall cause the one to be instrumental in promoting the prosperity of the other—a reciprocity of services, as it were, which ultimately converge in the general advancement of the whole, which, in agriculture constitutes a system, which system must be rigidly adhered to if any thing like profit is to be looked for in farming. Green cropping, which forms an important part of this system, and which is, in fact, the basis of all good husbandry, is what Ireland is most defective in; and, being defective in this, she cannot excel in the other two great branches which have been mentioned—nor does she, for, instead of about five kinds of green crops which might be grown, we find only one taken, potatoes; and we see white ones substituted, and a number of these taken in succession off the same ground—a practice which has been reprobated by every good agriculturist, and with reason, when the pernicious and ruinous nature of it is considered. It will be allowed, that on tillage farms, by which term I of course exclude grazing ones, it is mainly by the sales of grain and cattle that the occupier becomes enabled to pay his rent; but neither one nor the other can be uniformly produced of good quality, *without the intervention of green crops.* The fact is, that green and white cropping must be *alternate* to be remunerative, and this would throw one half of the arable land in the country under the cultivation of these crops,† (common and Swedish turnips, beans,

* "On very heavy carse lands, where there is a difficulty in growing turnips, and consequently of rotting straw, by feeding cattle through the winter months, this purpose may be accomplished by growing a greater breadth of clover, vetches, lucerne, &c. and feeding cattle on these in summer, in straw yards or sheds, keeping them well littered.

† "Over the entire land *under crop in one season* in the north of Ireland, it may be stated that one-fourth of it only is—or under present circumstances can be—in green crop, (potatoes.) The other three-fourths are under white crops, several of which are necessarily taken in succession.

mangel wurtzel, potatoes, &c. are referred to,) which is precisely the state it ought to be in; and were this to take place in Ireland, it would be very easy to show, that the rental of the country might be doubled in a very few years, and employment afforded to many thousands of the now destitute, because unemployed population. It was said some time ago with regard to the cultivation of tobacco in the county of Wexford, that it was a pity it should be interfered with or impeded by any legislative enactment, because the culture of it was found to afford employment to such a number of the peasantry; now this was just because it was a green crop, and the necessary preparation of the ground for it, and the subsequent hoeing, weeding and picking, &c. required the labor of an additional number of hands, which would be precisely the case with regard to other green crops. The Highland Society of Scotland have done much good by their practice of offering premiums for the best number of acres, according to the size of the farm, of potatoes, beans, mangel wurtzel, turnips, &c. *in drills;* and this is just what the North-East Society of Ireland require to do to make their arrangements complete, because in the other two great branches which have been mentioned, the society do already offer premiums.

"Should the society think proper to adopt this plan, there can be little doubt it would prove of essential service to the country. It would, in the first place, have the effect of checking the prevailing practice of taking white crops in succession off the same ground, which, I repeat, is one of the worst features of Irish farming, and the rock on which all is overset.* And this evil induces another and a serious one, which the adoption of the above plan would also tend to put a stop to, namely, the practice of selling the greater part of the straw, and sending it off the farm. This the farmer does at present, and, by doing so, becomes the robber of his own fields, and ultimately of his own pocket, of course; but unfortunately he has, at present, no alternative. Two circumstances combine to render this false step imperative on him—one is, *the want of green crops* for feeding cattle, by which means only straw can be conveniently and advantageously converted into dung: the second is, that the article is in great request for another purpose; thatch. The former circumstance I have already noticed, and shall conclude with a few remarks respecting the latter.

"Through the north-east district, and over the north of Ireland generally, many of the houses composing the villages, and the greater part of those in the surrounding country, cottages, farm offices, &c. have roofs of this nature, and a vast quantity of straw, therefore, is annually consumed in making new roofs and repairing old ones; and although it may appear at first view, that taking white crops in succession would have the effect of raising a great abundance of straw in the country, yet this is the very thing which causes a comparative scarcity, for the straw of an oat crop is not much more than half the bulk it would be, if, instead of succeeding wheat, it had succeeded potatoes, turnips, beans, mangel wurtzel, or grass—the latter is what in a regular rotation it generally does succeed—of the second crop of oats, the straw is perhaps not one-fourth the weight it would have been, had a green crop intervened; and as to a third crop, it is not worth comparing—even the straw of the wheat crop is not always equal to what it might be, for though it does succeed potatoes, yet it must of necessity be more or less affected by the scourging nature of the practice referred to, and to which the ground has probably been subjected for many years. The supply of straw, therefore, it will be seen, cannot fail to be very limited; certainly over the north of Ireland, not one half of what it would be, were an alternate system of cropping understood and acted on; and this circumstance, coupled with the constant run upon the article for thatch, causes it to rise in price sometimes beyond that of hay; and the poor farmer cannot resist the temptation,—indeed it is scarcely to be expected that he could—of selling "all he can spare," as he says—meaning all above what will be required as fodder for his few cows, but as for sparing, he could not spare an ounce—no farmer could spare the least portion of any substance convertible into the indispensable and all-important article of manure, except, indeed, in the neighborhood of large towns, where straw may often be advantageously sold, because you sometimes can, for the price of the straw, purchase a greater bulk of dung than the rotting of it would make; but where no such advantageous exchange can be made, it is a ruinous practice for the farmer to sell his straw, the material of which dung is composed. An effort, therefore, made to cut off this great demand for straw—this premium held out to farmers to become accessory to their own ruin—would certainly be a laudable one; and I think it might be made, with success, by endeavouring to introduce some article for roofing, which should combine cheapness with durability, and which might be expected to supersede the use of straw altogether. Slates are too expensive, and not to be thought of as roofing for cottages or houses in the situations I have mentioned. We want a roof as cheap as straw in the first instance, and one which would, from it's durability, be eventually much cheaper—one which would not require to be repaired or renewed every four or five years, a circumstance, by the by, which renders thatch a very dear roof in the end. But, there is an article used for roofing in various parts of Britain, and which has had a long and satisfactory trial there, and which I feel confident could be introduced here with great advantage, possessing, as it appears to do, the very requisites we are in search of; I mean the *roofing tile,* known by the name of *pan-tiles.* These tiles are made about a foot broad, and about 15 inches long, and the price in Scotland is from 7s. 6d. to 10s. per 100. For a good substantial roof the rafters are put on 18 inches apart, and the laths 1½ inch square, are nailed on the rafters at such distances as will allow a sufficient overlap for the tiles. This roof will, in the first instance, be found as cheap, if not

* "The only case in which this practice can be resorted to with propriety, is when *old grass* land is broken up with the intention that it should undergo a course of cropping. Here it becomes necessary to take, at least, two white crops in succession, (oats and wheat, oats and barley, or oats and oats, according to circumstances,) in order to rot the sward sufficiently; and the accumulation of manure caused by the decomposition of vegetable matter during the first year, renders this always a justifiable measure, and is in strict accordance with the rules of good husbandry—indispensable, in fact, to the effectual rotting of the old sward.

cheaper, than a thatched one, while the endless expense for future repairs would be in a great measure avoided. It may be said these tiles are not to be had in this country; true they are not, but one or two for patterns, with one of the moulds used, could easily be obtained from England or Scotland, and then they could be made in any quantity at those establishments here, where ridge tiles, flooring tiles, bricks, &c. are manufactured."

WINTER VETCHES.

From a late "Practical Treatise on Agriculture," by Richard W. Lloyd, London, 1833.

"A common notion prevails respecting this plant, that it is useless to sow it without manuring very highly, and with such an impression it is not to be wondered at, that the cultivation of it is neglected, for farmers naturally enough will apply their manure to crops they consider more valuable; but this opinion is quite erroneous, and how it was ever created I do not know, it is therefore high time to controvert it. As facts have much greater weight on men's minds than any thing that can be advanced in the shape of theory, I will state, that in the autumns of 1829, and 1830, I sowed vetches, three bushels to the acre, (at the end of October, much too late,) on land of very ordinary quality, without any manure, and in June cut them of very luxuriant growth: I merely mention this as a fact worth knowing, where a contrary opinion prevails. Every crop will, of course, do better with, than without manure; but of all the plants that I am acquainted with, I do not know *one* that will thrive better without, than the winter vetch: if the farmer can spare manure for it, the crop will, of course, be stronger and more abundant. I sowed two acres on the 19th of last September, (two measures to the acre,) half of the field being manured and the other not, and the difference in forwardness is very great; the vetches on that part which was manured are now (12th of April, 1832) ten or twelve inches high, and if the spring be mild, will be quite ready for cutting the first week in May: the others, sown without manure, are about six or seven inches high, and will be ready for cutting by the time the earliest are consumed. It is well to have a certain breadth of land sown with spring vetches, to succeed the winter: I have two acres of the spring vetches at this time (12th April) just peeping through the earth, which is a practice worth a farmer's consideration.

"It is impossible to distinguish a difference between the spring and winter vetch seed; but if any imposition is practised on a farmer by his seedsman, it may be detected as soon as the plants spring up: the winter vetch comes up green, and the spring vetch of a deep brown purple color: this observation may be useful, as it enables the farmer, in case of sowing a spurious sort in the autumn, to detect the imposition: if he finds he has sown the spring kind at that time, he must plough his land again, and apply it to some other purpose, for the spring kind will not stand the winter. I should recommend every farmer purchasing the winter vetch to have the seed warranted; and when he has got the right sort, afterwards to raise his own.

"The great secret in the cultivation of this crop is to sow early; it may be sown from the middle of August to the middle of October: if sown between the end of August and twentieth of September, two measures of seed will be sufficient per acre; if later, three measures: the early sowing is far preferable, as it saves seed, and becomes ready to cut much earlier than the late sown; but for the sake of succession, perhaps to sow at two different periods of the autumn is the best plan.

"Some farmers throw in a small quantity of rye or winter* barley, for the purpose of supporting the vetches; but I think the practice unnecessary, for the corn blades are not strong enough to answer the purpose intended.

"The advantages of this crop are very great, it improves land, and by its rapid growth destroys all weeds; if any should come up among them, they are cut down before they ripen their seed: to cleanse land from the wild rape or charlock, no crop is better than the vetch, both falling together under the scythe in a green state. It is a good preparation for any kind of corn, pulse, or green crop, the chief observances being only to sow them early and on clean land: as soon as ever the stubbles are cleared, let such of them as are intended for this crop be prepared; if manure can be spared for them, it must be remembered that the land will be in sufficient heart, for any crop whatever, the ensuing year, without an additional quantity.

"An idea prevails in this country, that land after having been a certain number of years under the plough, becomes sick and unproductive, and that the only remedy is to lay it down to grass. Let farmers occasionally throw in a crop of winter vetches, and they will find their land as much renovated by them as the laying down system. It has been well proved in the neighborhood of London, that land, by the growth of them, may be brought to the very highest state of fertility; there are fields in those districts that are constantly under the plough, and every year yielding good crops. To so high a state of cultivation have they brought their land, that after the vetches they put in turnips, gaining *two* well matured crops in *one* year, and after the turnips sow wheat or barley. This is a system that cannot be adopted in Wales until great improvements have taken place, because the land is not rich enough to produce two crops in the same year, nor are the farmers *active enough* to effect it; it will be a sufficient pleasure and satisfaction to the country, when we see farmers insure to themselves by their industry and skill *one good crop* in the twelve months, and when *that* period arrives, which I fear is far distant, it will *then* be time to talk of two crops.

"As a food nothing can be better than vetches, they support horses, cows, and sheep well; and store pigs thrive as well upon them, as any other food that can be given to them. I should recommend every farmer to keep his pigs up in styes, in each of which there should be a cratch, through which the pigs will draw the vetches, and every morsel will be eat; if they are thrown carelessly into the stye, a large quantity is wasted by being trodden under foot. The pigs should be kept quite clean by frequent littering, and have as much food supplied as they will eat; the quantity of manure

* This grain is much more profitable than the common spring sort. It is in its nature similar to wheat; it bears sowing at the same time, and stands frost equally well. The ears being six rowed, it yields much more abundantly than the spring barley, and ripens from about the 20th to the end of July in this climate.

raised by this plan in the summer time is almost incredible, and manure of the *very best* quality. For the first two or three years a farmer may complain of the want of straw for this purpose; if he has not got it, let him buy it from tithe takers, (as long as the system lasts,) or wherever he can meet with it; no money that he spends will pay him better in the end; after the first two or three years, he will have no occasion to buy straw; for his own land, by gradual improvement, will yield a sufficient quantity for all his purposes. It is a most profitable work to carry fern from the mountains; I should strongly recommend every farmer who has it in his power to do so; nothing will pay him better for his labor; by these means, and an extensive growth of succulent food, he will raise large heaps of manure, the grand basis of the subject under consideration.

"Another great advantage of vetches still deserving notice, is the vast benefit derived from them in a dry summer. When the little food that the pastures supply, has been either eaten up or scorched by the intense heat of the sun, what an advantage at such a time as this, must it be to a farmer, to have a reserve field of most nutritious and luxuriant food, from which to supply the wants of his stock of all kinds. He may either feed them within doors with the vetches, or spread them in small heaps in the burnt up-field; in either way, all sorts of cattle will eat them greedily and thrive well upon them. I have tried both ways, and each answered, but the former is the preferable plan (for every animal, excepting milch cows) on account of the manure raised by it. It may be observed that they are excellent things for causing the secretion of milk; and for store pigs and breeding sows, I must once more impress upon my readers, that nothing can excel them. The last observation to be made upon this most valuable of all crops is, that farmers should not confine it to a paltry quarter or half acre of land, but introduce it upon an extensive scale; to every forty acres he holds, let him grow five of vetches, say two of spring and three of winter vetches, and if he finds that there is likely to be more than he can consume, (which ought not to be the case,) he may allow the surplus to ripen its seed."

MANAGEMENT OF BEES IN CASHMERE.

From the Quarterly Journal of Agriculture.

Every farmer in Cashmere has several beehives in his house, and in some houses I have counted as many as ten. A provision is made for these in building the house, by leaving appropriate cavities in the wall, and which somewhat differ in size, but agree in their general form, each being cylindrical, and extending quite through the wall. The tube thus formed is lined by a plastering of clay mortar, about an inch in thickness, and the mortar is worked up with the chaff or husk of rice, or the down of thistles, which latter is employed for clay mortar in general, being the first application of this substance to the use of man which I have yet witnessed. The dimensions of a hive are, on an average, about fourteen inches in diameter, and when closed at both ends, about twenty or twenty-two inches in length. The end of the cylinder nearest the apartment is closed by a round plaster of red pottery ware, a little convex in the middle, but with the edges made flush with the wall by a luting of clay mortar, and the other extremity is shut by a similar disk, having a circular hole about a third of an inch in diameter in the centre.—It does not appear that there is any particular rule for the height of these hives from the ground, as they are sometimes confined to the walls of the lower basement story, generally appropriated to cattle in the farm-houses of Cashmere; others are inserted into those of the first floor, and are frequently in both situations in the same house, as well as the walls of its outbuildings. So great difference exists betwixt the practice ordinarily pursued in Cashmere and in Europe, in respect to hiving new swarms when the honey is taken, that it deserves imitation. Although the season for taking the honey had passed when I visited Cashmere, in the beginning of November, the cottagers indulged my wish of seeing the process by which this was effected, but with little injury to the bees, and with perfect safety to the individuals concerned in its management, and which was as follows:—Having in readiness a wisp of dry straw, and a small quantity of burning charcoal in an earthern dish, the master of the house, with a few strokes of the point of the sickle, disengaged the inner plaster of the hive, bringing into view the combs suspended from the roof of the hive, and almost wholly covered with bees, none of which, however, offered to resent the aggression, or to enter the room. Having placed the straw upon the charcoal, and holding the dish close to the mouth of the hive, he blew the smoke strongly against the combs, but removed the dish the instant the straw took fire, to prevent it burning the bees, and quenched the flame before he employed it again. Almost stifled by the smoke, the bees hurried out of the outer door with such rapidity, that the hive was cleared of its inhabitants within a few minutes, when the farmer, introducing the sickle, cut down the combs nearest to him, which were secured into a dish previously slidden underneath them, and left undisturbed about one-third of the combs, which were almost close to the outer door. He then replaced the inner plaster, and brushing off hastily a few bees that clung to the combs, though apparently in a state of stupefaction, threw them out of the house. Observing many other bees lying motionless on the floor of the hive, I inquired whether they were dead or only stupified, and was answered that they would recover; preparations for continuing my journey at a very early hour on the following morning, having unluckily prevented my examining the spot where they had been thrown out, until poultry had for some time been feeding near it.—The expelled bees returned as soon as the cavity was freed from smoke, without stinging a single individual, and the whole business was completed in less than ten minutes, without, as was asserted, any perceptible loss. The honey was light colored, and of a taste as pure and sweet as that of Narbonne. It possessed less of the cloying quality generally attending this substance, than any other I recollect to have met with; nor could I learn that the farmer had any suspicion of its ever being intoxicating or poisonous, as in the case occasionally with that made by the Bhoura (*Apis iritabilis*), or large wild bee in the northern mountains of Gurwhal, from feeding, as it is reported, on the flower of the monkhood. I was directed more particularly to inquire upon this subject, by having observed this plant in flower in

the valley of Bunga, a few miles to the eastward of the bee district, and think probable that it extends to these mountains.—The peasantry of Cashmere are unacquainted with the employment of honey as the basis of a fermented liquor, but eat it raw or mixed with articles of common food, whilst the most wealthy substitute it for sugar in preserving fruits. It is customary to take the hive every year; about the end of September or beginning of October is found the best season for this operation, a little time still remaining for the bees to add to the portion left for their support during five months. This amounts to about one-third of the whole produce, and would appear to suffice, as swarms seldom die, and the Cashmeres substitute no other article of food. It is stated that an old swarm yields more honey than a young one, and that families seldom die except of old age. I was informed that it was no uncommon circumstance to preserve the same community for ten or even fifteen years; and some instances were quoted of a family having been retained for twenty years; but this was held to be a very rare occurrence. In consequence of the bees being thus literally domesticated, they acquire a mildness of conduct far more decided than those of Europe; and it is possible that the confidence thus gained, subduing their natural irascibility, may generate an increase of industry, or at least an increase of produce in relation to the number and size of the individuals of each community. It is also clear, that the situation of the hive keeps many of the natural enemies of the bees at a distance.—The bee of Cashmere is a little smaller than that of Europe, though a little larger than the domesticated bee of Kumaon and of Gurwhal. The Bhoura, the rock-bee of Gurwhal, or the bee of the southern mountains, is, on the other hand, greatly larger than the domesticated bee of Europe, and greatly exceeds it also in the number of individuals in each community, and in the size and weight of its combs. But its honey is sometimes contaminated by an intoxicating quality, and the temper of the insect is so irritable, as to be brought into a dangerous state of activity by a slight show of aggression. The former quality is suspected, upon probable grounds, to be caused by the secretion of the aconite eaten by the bee, and its irritability of disposition, to be owing partly to the exposed situation of the combs suspended from the lower surface of a ledge of rook, and partly to the occasional attempts of bears to carry them off. But these detractions from the merits of this bee are merely the result of localities; and under due precautions, it is presumed that its irrascibility might be so far subdued as to render it just as safe an inhabitant of a wall-hive, as the smaller variety of bee. In a portion of the Paujab, near the hills, this bee is also met with; and I have seen the under surface of the principal branches of a large Peepul tree studded with so many colonies, individually of such great strength, as to deter the neighboring peasantry from attempting to deprive them of their stores, notwithstanding it was conjectured that there were several hundred weight of combs on the tree. The largest of these assemblages of combs—the probable accumulation of many seasons—was of such a size as I think it not prudent to cite; but from the specimens I have seen of the produce of this bee, I conceive their domestication, if introduced into Europe, would prove a most valuable acquisition to this branch of farming, although I must confess myself unable to devise any safe and easy plan for transporting such a colony.—[*Mr. William Moorcroft in the Journal of the Royal Geographical Society.*

THE WATER SPIDER.

From the Quarterly Journal of Agriculture.

The habitation of this insect (*Aranea aquatica*) is chiefly remarkable for the element in which it is constructed, and the materials that compose it, being built in the midst of water and in fact of air, a very uncomfortable one certainly, were it constantly wet; but this, the sagacious insect has the means of avoiding, and by availing itself of some well known philosophical principles, constructs for itself an apartment in which it resides in comfort and security. The following is the process: *First*, It spins loose threads in various directions to the leaves of water plants, which may be called the frame-work of the chamber, and over them spreads a transparent varnish, resembling liquid glass, which issues from the middle of its spinners, and which is so elastic as to be capable of great expansion and contraction. The spider then spreads over its belly a little of the same material, and ascends to the surface. The precise mode in which a bubble of air is drawn in beneath the gummy matter is not accurately known; loaded, however, with the material for its little mansion, which, to the spectator, looks like shining quicksilver, the spider plunges to the bottom, and, with as much dexterity as a chemist, transfers gas into a gasholder, introduces the bubble of air beneath the roof prepared for its reception. This manœuvre is repeated ten or twelve times, until, at length, in about a quarter of an hour, as much air is obtained as is sufficient to expand the apartment to its proposed extent, and the industrious little builder now finds itself in possession of a perfect air-built dwelling, affording a commodious and dry retreat in the very midst of water. Here the inhabitant reposes, unmoved by the storms that agitates the surface of the pool, and devours its prey at ease and in safety.

SAXONY WOOL.

From the Quarterly Journal of Agriculture.

To the late King of Saxony, when Elector, is due the merit of having first brought the breed of Spanish Merino sheep into Germany, which has since transferred the valuable trade in fine wool almost wholly from the Spanish to the German soil. From the period of its first introduction until 1814, when Europe once more began to enjoy the blessings of a general peace, this wool was gradually, although slowly, spreading itself over the surface of the kingdom of Saxony; but when the continental trade was thrown quite open, by the events of the short campaign of 1815, and the minds of men were set at rest by the final catastrophe of Napoleon, the Saxon wool dealers began to open a regular trade in the article to England, and they soon discovered the real value of this new branch of German commerce. In the first year, viz.:—

In 1814, there were imported into England only - - 3,593,146 lbs.
" 1819, - - - - - 4,557,938
" 1824, - - - - - 15,432,657
" 1828, - - - - - 23,110,882

This prodigious increase in the demand for Ger-

man wool naturally excited the emulation of the States lying contiguous to Saxony; and the flock masters of that kingdom carried on, for a considerable period, a very prosperous trade in rams and ewes with the land-owners of Silesia, Bohemia, Austria, and other parts, who were desirous of changing the nature of their flocks to this more profitable breed. All the superabundance of grain, which had no external vent to carry it off, was given to the sheep, in order to accelerate their approach to the maximum degree of fineness of which their wool was susceptible; thus actually creating a profitable consumption for their corn, through the eagerness exhibited in England to obtain a superior quality of wool.

ON THE USE OF DUTCH ASHES AS MANURE.

By Mr. John Mitchell, Jr. Leith.

From the Prize Essays and Transactions of the Highland Society of Scotland for the year 1833.

In a short communication sent to the society some time ago, I endeavored to bring under their notice a very valuable and cheap species of manure, which, on a late tour made by me on the continent, I observed was much prized, particularly in Flanders. I then placed at the disposal of the society twenty casks (about seven tons) of the substance in question, which have been delivered free of any charge to several noblemen and gentlemen, eminent agriculturists, who will have an opportunity of trying their efficiency.

When in Flanders, I found the farmers generally complaining of the serious injury they were likely to sustain in consequence of being almost entirely deprived, from interruption of the communication with Holland, of an article which they considered essentially necessary to their domestic economy, namely, *Dutch ashes;* and as that article can be imported at a very moderate price, it is of importance to consider how far it may be proper to introduce it into this country.

In Holland, there are two kinds of turf or peats used for burning, namely, those cut as in this country from the bogs, which burn easily, but give a whitish kind of ashes, which are of little use; and another kind, more generally used, as being more durable. Having witnessed the mode of making this kind, I shall here describe it. At those ditches or ponds made by cutting away the common peats, or upper parts of the bogs, men were employed in dragging from the bottom, by means of long sticks, having hooped bags at the end, the soft portion of the peat under water. They poured it out on the adjacent ground, when the water was allowed to drain off. After exposure to the air, this substance becomes in a few days sufficiently consistent to be cut into pieces of the size of a common building brick, which are dried for the use. The ashes from this kind of peat are of a yellowish brown color, and are the kind so much prized in Flanders: carts go regularly round to the various houses, where this turf is used, and carefully collect all that can be obtained. When the communication was open with Belgium, the ashes were sent by water to Brussels and other places in that country, and, after a long water carriage, they were often conveyed fifty, and even a hundred miles farther by land.

These ashes are used in various ways in Flanders. They are generally sown upon clover, at the rate of twenty five cuvelles per hectare, equal to about nineteen bushels per acre, imperial measure. They are sown on clover, wheat, and pastures, in March and April; on oats and beans in the beginning of May; on rye in October and November. They are also used in gardens with great benefit to the crops, by being scattered over the surface, after the land is sown and raked. They are also good for hops, a handful being given to each plant. When applied to grain, they promote its early growth; but are principally useful in increasing the quantity. They are generally sown by the hand like grain, but care must be taken to leave no part of the surface without its just proportion.

In Holland the mode of applying them is as follows. In March, the wheat is worked with the hoe between the rows, and sown with clover; and in May, the rows of wheat are weeded. The wheat being reaped, and as soon as the danger of floods is past in the spring, the land is harrowed, and thereafter they strew about twenty imperial bushels on the acre of clover. This practice is greatly recommended, and found to be highly advantageous.

An eminent Dutch agriciculturist, F. L. W. Brakkel, in a work lately published by him at Utrecht, points out the advantages of using Dutch ashes on the clover in this way, his alternation of crops being potatoes, rape seed, peas, wheat, clover and oats. Another writer on agriculture, J. R. Schwarz, says the ashes must be used in their dry state, and thinly strewed, and on ploughed land must be harrowed in before or at the sowing. They are of most use on cold wet grass lands to dry the ground, destroy the acidity, and kill the mosses. They are so much persuaded in Belgium of the great use of Dutch ashes, that the farmers have the following proverb: "He who buys ashes for clover, pays nothing; but he who neglects doing so, pays a double price." The great advantages to be derived from thispractice are also pointed out by Sir John Sinclair, in his Tour in Flanders, and many other testimonies might be adduced in its favor.

By an analysis made by Professor Brande of the Royal Institution, the contents of the specimen given him were:

Siliceous earth, - - -	32
Sulphate of lime - - -	12
Sulphate and muriate of soda, -	6
Carbonate of lime, - - -	40
Oxide of iron, - - -	3
Impurities and loss, - -	7
	100

The great advantages which the Dutch ashes hold out to the farmer are, their being a cheaper, and (at least for some purposes,) more certain and beneficial manure, than any now in use. They can be easily transported to a great distance; they give a greater number of bushels to the ton than bones or rape cake, and they are only about half the price per ton of either. It has also to be remarked, that bones are getting scarce abroad, and are rising in price. Besides, the Dutch ashes require no previous expense or preparation in this country, but can be immediately applied after being landed; whereas, bones and rape cake have to undergo the process of grinding, before they are fit for use.

As a top dressing, these ashes are superior to common manure, it having been found, on making comparative trials in Flanders, that the crops of clover, where the ashes were used, were much earlier, heavier, and superior in every respect to those which had undergone a top dressing of horse and cow dung. As a top dressing to the second crop of clover, they will be found highly advantageous, as by being used this way, they wonderfully increase the rapidity of growth and produce. One of the best proofs of their usefulness is the fact, that while we have frequently in this country very backward and light crops of clover and grass, in Flanders, where this top dressing is used, such a defection seldom if ever occurs. They are therefore likely to be of great use to the farmer on the lands which have "grown sick of clover;" and the importance of having a good crop of clover is the more obvious, when it is considered that, in general, the succeeding crop of wheat is only good when the preceding crop of clover has been so.

Besides fertilizing the land, the ashes may be of great advantage in preventing the injuries arising from worms or insects; and will no doubt be highly useful as a top dressing, if regularly persevered in for a certain time, in destroying the mosses and lichens so apt to injure the lawns and natural pasture in this country.

I have found a bushel of these ashes to be about forty pounds in weight. The ton, therefore, consists of about fifty six bushels. At 3*l.* per ton, which will be the price from the shop, free of every charge, the expense of manuring an acre will only be about 1*l.* [or $4 80.]

ON THE SEVERAL PLANS USED TO PREVENT THE WASHING OF HILLY LANDS.

To the Editor of the Farmers' Register.

I perceive by your last No. (9) that a Charlotte correspondent has come out in disapprobation of the "trenching" system; and recommends a substitute, for which he vouches his own successful experience. Now, though Mr. Bruce, as its original advocate, will more properly respond to his objections—and though your own editorial remarks will in some measure neutralize what I regard as the ill tendency of his piece—yet I must beg space for explanation. I ask it the rather that I have unwittingly committed myself, where I knew not that controversy was likely to arise. And particularly because I recognize in "Wardsfork," (if not deceived by internal evidence, as well as the point from which he hails,) "an acquaintance and friend," from whom I have heretofore received valuable instruction in our common calling; and I should be loath to acquiesce in a difference, which may be more apparent than real.

The evil complained of is the loss of soil in broken land, produced by the washing of heavy rains. The desideratum is the proposal of an effectual preventive. We all know that formerly, in Virginia, extensive occasion was given for injury from this cause, by scourging newly cleared hills with successive hoe crops, without rest under grass—and by injudicious ploughing. By the one, the soil was worn to barrenness, and thus exhausted of the vegetable fibres which had contributed to its powers of cohesion; and the parallel furrows of the other, in their perpendicular descent, brought down soil, and substratum, to cover, with a barren coating, the more fertile land below.* This destructive course was continued by many through ignorance of a better; and even when the era of improvement was commenced, the expediency of attempting to repair the injury already done was not universally acknowledged. "Go on," says A to B, "and while you are saving and improving one hill side, I will make another produce money enough to buy a dozen more." This riotous system could not last. The annual waste of land from this source was immense, and some change for the better became indispensable. Happily one was suggested, after our forests were much diminished, and the rage for new clearings had begun to subside.

It is more than thirty years since the late Gov. Randolph introduced on his farm in Albemarle, "horizontal ploughing" and the hill side plough. Both the mode and the implement had, it seems, been known abroad long before. But to him we owe the timely bringing to our rescue the invaluable aid of the practice itself. From him the practice spread rapidly on all sides, until it became almost universally adopted—meeting a slight resistance in its course from the advocates of cross ploughing. Never was any improvement so highly lauded, or indeed more properly. And the incalculable benefit which a son of Virginia, by its means, has conferred on our whole country, will excuse a reference which might seem commonplace. It instantly, as I conceive, more than doubled the value of every arable steep in our land. By its means the work was better executed—with greater ease to man and beast—and a reserve of moisture was retained, for nourishing the roots of plants at a season, and in the mode which they most required.

It was also declared to be a sure preventive of the evil in question; and perhaps, when well performed, it is a sufficient preservative of a somewhat tenacious soil on a moderate slope. But it was found not to be effectual in all cases. And while it was thus eulogized for virtues which it did not possess, some farther change, or addition, was called for.

I had heard of various expedients to meet the exigency, such as a partial declination of the beds and furrows—leaving a belt of turf unploughed at the line of stress—Mr. Skipwith's trenches—and lastly, what are termed the "graduated furrows." This last I considered most eligible, as answering the purpose, and as being free from objections to which the others are liable. It being the last in a series of improvements, of which horizontal ploughing was the first, my former remarks were predicated on their comparative value, and the necessity of this as an occasional auxiliary. The hypothetical case of the conical hill with the spiral furrow was not cited as a guide for practice, but for the purpose of illustration—and in this view, every rounded hill side may be considered as part of a cone.

All of the above modes with the exception of the second, are based on the same principle—that of providing an artificial channel, by which the redundant rain falling in a given space, may be conducted from the hill, without carrying the soil with

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* It is said that the late John Randolph of Roanoke, once in passing such a scene, remarked to his travelling companion, (pointing towards it with his "fearful fore finger,") "that, I take it, is very far from being *real* estate, sir."

it. Nor, I conceive, is Wardsfork's founded on a different one, but is a mere variation from, or perhaps an improvement on that which he so pointedly condemns. There are not a few points of resemblance between them. In either case the same levelling instrument is used—the same graduation adopted. The beds and the furrows are recommended to be placed at the same intervals apart. Each commences at a middle point on the face of the hill, and proposes the descent from thence to the ravines respectively on the right and left. And if the beds be thrown up as high as Wardsfork suggests, there is above each, emphatically, a "graduated furrow," or shallow *ditch*, however offensive the name. With this difference, that what is an embankment in the one case, and therefore safer, is but a bed in the other, i. e. an embankment flattened, and having its edges rounded off. It is in fact but transferring to a steep the mode of draining recommended in your No. 7. You have already said, editorially, that the turfed ravines may be used in connection with either mode. Wardsfork lives in a region whose general aspect is materially different from that in which the writer of this resides. I suppose his hills are not long, and mostly of gradual elevation. To them, I doubt not, from his own experience, that his system of throwing up high beds at intervals, may be judiciously applied. But how would it take in our mountains, some of which are cultivated to the very tops. "This tricke," as old Barnaby Googe said of the reaping machine, "might be used in level and champion countreys, but with us I trowe, it wold make but ill-favored worke."* We have many arable hills in Virginia so steep that the highest bed which Wardsfork could raise with his best ploughs and teams, and the after dressing to boot, would not suffice to prevent the over-passage of the water. And the longer the hill the greater the difficulty; and we could rely on them still less where the soil was light and loose, and had previously been worn into gullies.

Most of Wardsfork's objections to the ditching system relate either to its imperfect execution or its abuse; and all may be obviated when it is used, as it has been modified in some places.

In the first place, I believe that the alleged loss of crops, by abstracting so much land from culture, even where the ditches are as wide and deep as those of Mr. Skipwith, is founded on a misappre hension. There is certainly no loss in the long run, when compared with the old mode. It proceeds from a fallacy which unhappily has been too prevalent heretofore in Virginia. The acre which produces double the crop of another, is of more than double its value; as for these different products, the same amount of labor is bestowed on each. But the inquiry among us too often is, not what is the relative strength of our fields? but how many corn fields (good, bad, or indifferent) is the proper crop to "pitch" for a given number of hands? And there are many who persist to this day in cultivating parts of fields, the products of which, while unmanured, will not repay the charge of tillage. This is more particularly the case in broken lands, which they are discouraged from attempting to improve. For, as Mr. Bruce says, why manure them, when the first rain may sweep it entirely away. Any expedient then, which promises to retain both soil and manure, is not lightly to be rejected, without providing a better substitute, applicable even to extreme cases.

Now I would call Wardsfork's attention to a fact which he may have often observed Let him view from an opposite eminence the side of any rounded hill which is surmounted by a level of considerable breadth, and which, having been cleared and cultivated in the usual style for several years, is again recently ploughed. Even if no gully is presented, he will probably perceive three different shades of color, and it is likely, as many different qualities of soil. The middle belt will be in far better heart than either that above or below it, both of which will partake of the nature and appearance of the subsoil. This I suppose to be occasioned thus. The water which falls on the flat land above, is absorbed and secretly settling towards the brow of the hill in large force, either bears off the soil on its bosom, or else *strains* it (so to speak) of its fertilizing properties, and carries them down to the middle portion. As this is a broadcast operation, *there is accumulated*, as it were, *a double layer of soil on this belt*, which now presents a barrier strong enough to be stationary itself: but the water passing over, or through it, meets with less resistance in the breadth of soil next the base of the hill, and either carries it, or its strength, to the bottom. Such is the effect of the constant action of rains for a series of years. And the proprietor of such a hill, who has contrived to prevent a breach, (perhaps by having a stiff soil on a clay substratum,) flatters himself that he has succeeded in preserving the soil itself, when in fact, a large portion of it is reduced to a *caput mortuum*. Now, there is little doubt here, that had graduated furrows been interposed at the several lines of stress, to arrest the water in its descent, and give it a different direction, the whole result would have been different. There can be as little that the farmer, in their adoption, would have been more than doubly compensated for the portion of land appropriated to them, by their preventive good, as well as by the assurance of greater permanence to any future improvement he might impart to the intervals. Not to mention that, the gradual deepening of the soil, i. e. the increase of its quantity as well as quality, is a primary object which the cultivator should never lose sight of, and which can only be insured by some such mode.

Time was when the bedding of alluvial flats on the margins of streams was objected to on the same account, viz: that all the land occupied by the water furrows was lost to the grain crop. But even supposing that the rounded form of the beds did not repay this, the increased product, from effectual draining, more than counterbalances this partial injury. The graduated furrows, however, are used on hill sides, and when we consider the upward growth of plants, it will be found that, as in the case of garden terraces, they virtually demand much less space for themselves, than from a side view, would be supposed

But experience has shown that it is not necessary to have them in all cases as wide or deep as those of Mr. Skipwith. Those present a needless array of means for the desired end; and if the additional labor could be conveniently spared, to dig such little *races* on the hills of Wardsfork's Champagne country, would be like breaking flies on a

* See Farmers' Register, No. 7, page 407.

wheel. He has but to step over to the neighboring county of Prince Edward to find them in successful operation on a smaller scale. There, the principal part of the work is performed by ploughs; the whole of which is but little more than the best James river farmers expend in water-furrowing their lands laid down in wheat. Examples of like success elsewhere might be cited.

I object, as Wardsfork does, to the perpendicular ditch. Yet no plan proposed as yet, not even his own, prevents the partial descent of soil between the drains, in very heavy rains. It is nearly all caught, however, in the drains themselves, and may be taken out to the embankment with the hoes, after being loosened, if required, by the ploughs.

"But the carts break through them and make ruts down the hill." Really, Mr. Editor, if we are to be deterred from making any improvement by the occasional negligence of negroes and overseers, we might be forever stationary, or rather, retrograde. Carts have occasion to go on corn or wheat fields at but one season of the year, after the crop is seeded. If the proprietor has his farm roads properly disposed, I know of nothing to prevent their going directly on to each interval, and returning parallel with the furrows. Bridges are not needed; and if the carters did occasionally cross a drain, how long would it take the farmer to repair the injury, before a rain could come to make it greater?

"But lastly, it is complicated—difficult of execution." The greatest mystery connected with it is the use of the rafter level, which is common to both plans; and there is nothing very abstruse in running four furrows along a defined course with a hill side plough—the fourth to be in the track of the second—and afterwards drawing out the loose dirt with the hoes. Nor is the whole process expensive.

One word more. I have seen the graduated furrow used with advantage on a hill side which was in wheat, and where but little more land was lost by it than if it had been a flat. It prevented the formation of small gullies before the wheat had taken sufficient root to hold the land together; and as a smooth surface for this crop on broken land is preferred to bedding, Wardsfork's chief objection to its use is thus obviated. Might not a row of peas or some other low-growing plant, which would neither prevent the passage of the plough, nor obstruct the free current of the air to the adjacent row of corn, be set on the embankment of the "trenches," and thus prevent the partial loss of crop?

I find, Mr. Editor, that I have proceeded much farther than I intended, being led on by my anxiety to have the attention of my brother farmers drawn to this matter: and if I have stopped before I have finished what I had intended to say, it is in the hopes that others better qualified than myself, by experience and more extended observation, will give us their views of the relative value of these suggestions. There can be but one opinion as to the importance of the device, if successful. A large portion of the cultivated land in our country is broken in its outlines—and if it can be *secured* by these means, its value must be greatly enhanced, as it may now be ploughed with ease; and it is well ascertained that a hill side will withstand a drought better than the level above it—a consideration of no small moment in this climate.

I wish Wardsfork many happy returns of the luxuriant harvests from fields which he has restored to more than their primitive fertility, with such benefit to his country, and such profit to himself. He has favored us with his views of prevention: will he or some other of your hundred correspondents give us a dissertation on the *cure*—of gullies?

C. F. N.

ROOT CULTURE.

From the Genesee Farmer.

We have the pleasure to acknowledge the receipt of a letter from the President of the late Agricultural Society of Pennsylvania; and for our present number, select his remarks on the culture of esculent roots as a branch of husbandry. His skill and experience as a practical farmer, entitle his opinions to great respect. We hope hereafter to obtain his method of preparing the ground, and of applying the manure, which may be of importance to us, although there is a greater difference of climate between us than three degrees of latitude on the same plain would indicate. We wish to learn every particular; for though we adopt the opinion of our friend W. G., that *good land* in *good order* is necessary for turnips, yet there is room enough, even on this basis, for considerable diversity of practice.

"I have noticed in the Genesee Farmer, an article from Judge Buel on the culture of turnips. His object was to show the profitableness of that culture. I cultivate a stiff calcareous loam; and in such a soil, long experience satisfies me that the turnip is the only root crop worth attention. It is raised at less expense of labor and manure than any other that I have tried. The Swedish turnip, as Judge B. well remarks, will follow a grass crop. The white Norfolk turnip will follow several ploughed crops, such as flax, hemp, rye, or even potatoes. I have thought the soil was rather improved than impoverished by a crop of turnips. I have found them to make excellent beef and mutton.

"I have ceased to raise potatoes for live stock. I think good farming, where a certain market is not contiguous, requires the potato crop to go but little beyond table use. I have found them to require heavy manuring; and put in what you may, without another dressing, the ground will not be fit for laying down to grass. The boiled potato is a nourishing food for man and beast; but raw, it appears of little value except as an opening medicine. As food for man in high latitudes, they are the best substitute for bread; and will justify the culture, because a given space will produce more, and they are a much surer resource than frumentaceous crops; but in this part of Pennsylvania, even contiguous to the city, they make but a poor return in abundant years, from reduced prices; and in seasons of scarcity the result is not much better, from the expense required to make a crop.

"The mangel wurtzel and carrot will do little with us, though in a light granitic loam, I have observed that they succeed better. For stock feeding, the turnip is decidedly preferable. The white turnip feeds well through the month of January, and sometimes later. Indeed I have preserved them

quite sweet until March, by covering about fifteen bushels together, and then opening the heaps only as they were used."

APHIS LANATA.

From the Genesee Farmer.

Of all the numerous species of *Aphis*, perhaps that called in England "the American Blight," is the most to be dreaded. Through the carelessness of British nurserymen, it has been sent on young trees over to New Holland; and, from the same cause and quarter, it has arrived on our own shores. Our orchardists cannot be too much on the alert against this pest; and to show them the danger that threatens, we present our author's description of this insect.

[*From the Journal of a Naturalist.*]

"Our apple trees here are greatly injured, and some annually destroyed by the agency of what seems to be a very feeble insect. We call it, from habit or from some unassigned cause, "the American Blight," (*Aphis lanata*;) this noxious creature being known in some orchards by the more significant name of "white blight." In the spring of the year a slight hoariness is observed upon the branches of certain species of our orchards. As the season advances, this hoariness increases, it becomes cottony, and toward the middle or end of summer, the under sides of some of the branches are invested with a thick downy substance, so long as at times to be sensibly agitated by the air. Upon examining this substance, we find that it conceals a multitude of small wingless creatures, which are busily employed in preying upon the limb of the tree beneath. This they are well enabled to do, by means of a beak terminating in a fine bristle: this being insinuated through the bark, and the sappy part of the wood, enables the creature to extract as with a syringe, the sweet vital liquor that circulates in the plant. This terminating bristle is not observed in every individual: in those that possess it, it is of different lengths; and is usually when not in use, so closely concealed under the breast of the animal, as to be invisible. The alburnum or sap wood being thus wounded, rises up in excrescences and nodes all over the branch, and deforms it; the limb deprived of its nutriment, grows sickly; the leaves turn yellow, and the part perishes. Branch after branch is thus assailed until they all become leafless, *and the tree dies.*

"This insect is viviparous, or produces its young alive, forming a cradle for them by discharging from the extremities of its body, a quantity of long cottony matter, which becoming interwoven and entangled, prevents the young from falling to the earth, and completely envelopes the parent and offspring. This lanuginous vestiture seems to serve likewise as a vehicle for dispersing the animal. The winds wafting about small tufts of this downy matter, convey the creature with it from tree to tree throughout the whole orchard. In the autumn, when this substance is generally long, the winds and rains of the season effectually disperse these insects, and we observe them endeavoring to secrete themselves in the crannies of any neighboring substance.

"The first visit of this Aphis to us, is by no means clear. The epithet of American Blight, may be correctly applied: but we have no sufficient authority to conclude that we derived this pest from that country. Normandy and the Netherlands too, have each been supposed to have conferred this evil upon us; but it bids fair to destroy in progression, most of the oldest and long esteemed fruit from our orchards.

"I have very successfully removed this blight from young trees, and from recently attacked places in those more advanced, by an easy application: Melt three ounces of rosin in an earthen pipkin, take it from the fire, and pour into it three ounces of fish oil; the ingredients perfectly unite, and when cold, acquire the consistence of honey. A slight degree of heat will liquify it; and in this state paint over every node or infected part in the tree, using a common painter's brush. This I prefer doing in the spring, or as soon as the hoariness appears. The substance soon hardens and forms a varnish which prevents any escape, and stifles the individuals."

IMPORTANT TO CROWS.

The Salem Register publishes the following sketch of a debate in the Legislature on the bill for allowing 25 cents for every full grown crow, and 12½ cents for every young crow, ("children half price,") which may be killed in the state.

The members took occasion to indulge in a little pleasantry on this subject.

Mr. Ruggles, of Troy, spoke in defence of the character of the crow. They are the natural scavengers of our farms—they destroy the enemies of our corn fields, and do much more good than harm. He was always glad to see them. He was himself a farmer, and raised 300 bushels of corn a year. He always prevented any one from killing the crows, and frequently scattered half a bushel of corn about to feed them. He should be as willing to pay for their services as for any of the laborers upon his farm. He moved to strike out the enacting clause of the bill.

Mr. Greenwood of Hubbardston, (chairman of the committee which reported the bill,) defended its provisions, and spoke in a disrespectful manner of the character of the crow. Every farmer, he said, knows they are great depredators, and some are injured to the amount of thirty or forty dollars a year. He thought something should be done to encourage their destruction.

Mr. Forward, of Belchertown, thought there were other birds and animals as bad as crows, and ought to be destroyed just as much. There was the *Chewink* and *Chipmuck*—they too visit our corn fields. But he would ask any liberal minded man if he would grudge a kernel of corn to a poor chipmuck, when he sees him sitting hour after hour, with tears in his eyes, longing for something to eat? If any gentleman raises so much corn as to lose forty dollars worth a year by the crows, he can afford to hire a man, and find him powder and shot to protect it. If the crows are killed, twice the number would come to bury the dead.

An old farmer in the gallery said he at first thought this a small subject to legislate upon, but he was now in favor of doing something against the crows. He has known them to pluck out the eyes of little lambs! Would gentlemen let an animal that would do such a deed, go with impunity? As to *Chipmucks*, they could not fly, and

small children could set squat traps and catch 'em; there is no need of a bounty for them. Gentlemen must possess a very liberal spirit, as well as a great abundance, if they are willing to give corn to such a pernicious tribe as the crows.

A member moved a recommitment, to add chipmucks, chewinks, caterpillars, &c. to the bill.

Mr. Forward never knew crows to pick out lambs' eyes, but he didn't doubt the word of the gentleman in the gallery, for he once travelled in his part of the country, and upon his word he didn't believe there was corn enough raised there for the crows to subsist upon!

Mr. Darling, of Marblehead, said he once knew a corn field destroyed by a swarm of *rats*—he thought they ought to be included in the bill, and that it should specify at what age they should be considered *young rats* or *old rats!*

Mr. Forward said—the bill didn't point out the size or weight which constitutes a "full grown crow."

An elderly member asked whether the bill was to apply to the city of Boston?

Mr. Greenwood replied that it would not—no crow was ever seen in that city except a certain "*Jim Crow*," and he had no idea of shooting him!

Mr. Ellis said, there was a member of this House the last year by the name of *Crow!* He certainly would come under the denomination of a "full grown crow," and he saw no provision in the bill which would protect *him!*

The house having been amused for an hour by this crow shooting project, and the proposition having been sufficiently ridiculed, the question was taken on striking out the enacting clause of the bill, and carried in the affirmative by a very large majority.

TO KILL RATS OR CROWS.

From the Genesee Farmer.

"Bruise half an ounce nux vomica and soak 24 hours in warm water; then add 4 quarts, and soak it 12 hours; then sow the corn on the ground immediately after planting."

The above was taken from a paper some years since, and after trying corn soaked in arsenic without success, I tried the above; and early the next morning after sowing it, I found a crow on the ground, stupid; but on putting him in a cage he revived, and I put him in the field, and confined him to a board by tying his legs on the under side, after boring two holes to put his feet through; and immediately the air was black with crows, but no one ventured to disturb the corn. I should recommend to increase the quantity of nux vomica, that the effect may be more certain. For rats it should be mixed with meal, and put where the hens cannot get it.

ON THE KEEPING OF APPLES.

By Mr. Oliver, Gardener to the Earl of Rossyln.

The fruit room ought to be placed in a dry cold shady situation, free from wet, and sunk three feet or four feet in the ground. The shelves should be of beech or sycamore, about two feet wide and ten inches asunder. Fir shelving tastes the fruit. There is no need of fire in fruit rooms, for a little frost does not injure apples. There ought to be ventilators, as a good deal of air is necessary after the fruit is first gathered and stored.

When the apples begin to drop, the ripest are gathered, and taken to the fruit room in shallow baskets. These are taken singly out of the baskets, and placed upon the shelves.

"After the apples have been ten or twelve days on the shelves, the process of *sweating* is considered as accomplished. They are then wiped one by one with clean soft cloths; by this means a kind of *coat* or *shell* is formed, which proves a safeguard to the fruit. The shelves are wiped at the same time on both sides until quite dry. During the whole time the apples are in sweat, plenty of air is admitted, if the weather is clear and dry; but, if damp, the room is entirely shut up. I think it is when the apples are sweating that they imbibe the flavor of whatever materials they are laid upon; and, if due attention is given to them at that time, there is little chance of their afterwards acquiring any bad taste."

The fruit is turned over about the end of January, and, with the shelves, wiped, if any moisture appears. After this time the room is closely shut up; for the admission of much air, after the end of January, is found to occasion shrivelling. All the time the fruit is in the room it is carefully looked over every four or five days; and in the month of August it is handled with gloves, the hands of gardeners being generally moist at that season. When apples are frozen, no artificial means must be used to thaw them. If, when in sweating, they are affected by the frost or damp, they will be materially injured.

"I have gathered apples, and laid them upon one another in large baskets in a vinery, kept up to about 60° Fahrenheat, for 10 days or a fortnight: they were then covered with sweat. I had them wiped, conveyed to the fruit room, and laid on the shelves, as already described. I have never found the flavor of apples treated in this way to be in the least impaired."

RABBITS.

From the Farmers' Magazine.

The care with which a doe rabbit provides for her young is very remarkable. She not only makes a nest of the softest hay, from which she carefully munches out all the harder portions, but she actually strips the fur or down off her own breast to spread over the hay. At first she covers up her young ones with the same materials in order to keep them warm, uncovering them only for the purpose of giving them suck. She is also extremely careful in proportioning this covering to the severity of the weather and the tenderness or strength of her offspring, gradually diminishing it as they grow more robust.

CANAL MADE BY NATURE.

A most extraordinary freak of nature occurred, says the Kingston, U. C. Herald, during the late storm on Lake Erie. A channel was made through Long Point, 300 yards wide, and from 11 to 15 deep. It was in contemplation to cut a canal at this place, the expenses of which were estimated at £12,000.

TURNIPS TO THE ACRE.

Loudon, in his late tour of Scotland, says, the cultivation of turnips, in rows, is carried to so high a degree of perfection in Scotland, that 30 tons of Swedish turnips are calculated on to the statute acre.

For the Farmers' Register.

RYE IN THE GRAIN, AS FOOD FOR HORSES.

A friend, in whom I have every confidence, who is a gentleman of scientific acquirements, and a practical agriculturist, has just given me the following information, relative to horse feed.

While travelling recently on one of our public roads, he fell in company with a farmer, from one of the northern counties of Virginia, and in the course of conversation, the subject of feeding horses was mentioned; when the farmer observed, that for four years past, he had pursued a new plan, greatly to his advantage, as well as to that of his horses. The new plan was that of feeding rye, in the grain, without grinding. He said, that after four years experience, he had become perfectly satisfied, that less rye produced a better effect, than if it were chopped or ground. After much difficulty, he had prevailed on some of his neighbors to try it; and thus, gradually, all the horse owners in his neighborhood had become converts, and now all fed rye in the grain; all agreeing that a large portion of grain was saved by it, beside a marked difference in the condition of the horses for the better. He said, he could not give the "why and because;" it was different from the universal prescription of science, and the almost universal practice of intelligent husbandmen; but that the fact was before him, and challenged his belief in such a way, that to have continued incredulous, would have been to shut his eyes against the most palpable demonstration. The best of this is, that an experiment is easily made, and, even if unsuccessful, cannot result in material loss. But should it prove to be true, that rye in the grain is better, or even as good as when ground, a considerable saving would result to the farmer, in avoiding the trouble and expense of going to mill. The farmer stated, that he had observed grains of rye passed off in the dung, but that they seemed to have left their substance in the body of the horse. In this he is doubtless mistaken; but may not the *modus operandi* of this new diet be explained thus:—The grain that escapes crushing by the teeth, prevents the mass in the stomach, from concreting into lumps, and thus permits the free action of the juices of the stomach upon the whole. Persons afflicted with dyspepsia, swallow white mustard seed, with great advantage; but I believe it is not pretended, that the mustard seed has any other action, than a mechanical one—that of keeping the contents of the stomach from forming a dense mass; keeping the food light and penetrable by the gastric juices, &c.

The anecdote was given to me in so earnest a manner, and by so respectable a gentleman, that I thought, as I was about writing to you, I would give it to you for insertion in the Farmers' Register.

Very respectfully,

GIDEON B. SMITH.

Baltimore, March 15, 1834.

ON SUCKERING CORN.

To the Editor of the Farmers' Register.

Charlotte County, March 20th, 1834.

I had the pleasure, about four years ago, to spend a day in company with old Mr. Macon of North Carolina, when our conversation was principally on subjects of agriculture; and among others, the cultivation of Indian corn. After having inquired whether I had the suckers which grew from the roots of corn pulled off, as is the common practice, and received my answer in the affirmative; he informed me, that he suffered them to remain, having from repeated experiments, ascertained that they did not injure the corn; but on the contrary, the suckers more frequently than otherwise produced good ears of corn; and that if they failed to do so, there was an increase of fodder. I have since tried the experiment and witnessed the following results. That after carefully examining the ears of corn on the stalks producing suckers, they were found to be as good as the ears on the surrounding stalks not producing them—that a large majority of the suckers produced good corn, though the ears generally, were smaller than those on the mother stalk, and that (of course) there was an increase of fodder. Without entering into an inquiry, whether corn ought not be planted so thick, as to prevent its producing suckers, (if thick planting will prevent it, of which I am not sure,) or whether the pulling them off, may not injure the corn, by inflicting wounds on the stalks; I can now safely recommend Mr. Macon's practice, as saving the time and labor of pulling off suckers, and what is of more consequence, as producing an increase of the crop of corn and fodder. I ought to add, that none but the suckers growing from the root ought to be suffered to remain.

W. M. WATKINS.

DISEASED HORSES.

From the Genesee Farmer.

Messrs. Tucker & Co.—I have read the remarks of *Onondaga*, in the Farmer of Dec. 21, respecting the black tongue, and the doctoring of horses generally. I am pleased with some of his observations, but I think he is mistaken in some things. In speaking of the pulse of the horse, he says that fifty to a minute and upwards, indicates a high fever. So say I, if enough upwards of fifty. The pulse of a horse in good health, with low feeding, beats from thirty-six to forty per minute; if high fed, his pulse may go 45, and some more, without any more fever than is occasioned by the high feed. In simple and symptomatic fevers, the pulse will run from sixty to seventy-two, and in cases of inflammation of the lungs or pleura, in the early stage of the disease, the pulse is often from sixty-two to eighty, when nothing but excessive bleeding with continued clysters, will be of any service.

The best place to ascertain the pulsation of a horse, is under the jaw-bone, where the artery passes on to the side of the face. In this situation the artery is covered by the skin only, and as it rests against the bone, its strength or weakness may be ascertained with the nicest exactness and accuracy. When a horse is in health, the artery feels neither hard nor soft, but perfectly elastic; but, when in a fever, the artery becomes often so hard, as to resist the pressure of the finger, and will beat, as said before, from sixty to eighty a minute.

As there is nothing like comparing notes to come to the truth, I wish you to give the above a place in your Farmer.

A SCOTCHMAN.

TRANSPORTING COAL.

From the American Rail Road Journal.

A Comparison of the expense of transporting five thousand tons of coal, one hundred miles by locomotive engines, and by canal boats, deduced from actual work performed on the Little Schuylkill rail road, and on the Lehigh and Delaware Canals.

It is proper to premise that a locomotive engine has for a considerable time during the past summer made three trips a day, with forty-four tons of coal at each load; thus transporting one hundred and forty-four tons per day, from Tamaqua to Port Clinton. The usual business is however ninety-six tons for one engine; this is done with ease in short days, and could very conveniently be increased, if the daily distance to be passed was greater.

It is proposed in the following estimate to allow for the work of the engine, one hundred tons a day for twenty miles, or twenty tons a day transported one hundred miles, for two hundred and fifty days.

Capital Employed.

Cost of engine and tender,	$5,000 00
One-fifth additional is estimated,	1,000 00
Sixteen coal wagons at $100 each,	1,600 00
One-fifth extra,	320 00
	$7,920 00

Annual Expense.

Interest at 6 per cent.,	$475 00
Repairs at 10 per cent.,	792 00
Depreciation 5 per cent.,	396 00
One engineer at $2,	500 00
One fireman at $1,	250 00
Two breakmen,	450 00
Oil, 375 gallons at $1 12½,	422 00
Two cords pine wood per day at $2,	1,000 00
20 × 250 = 5,000)	$4,285 20
	$87 07

Or 87 7/10 cts. nearly per ton, for 100 miles.

The following estimate of the expense of transporting 5,000 tons on the Lehigh and Delaware canals, is deduced from statements furnished by boatmen, of the work actually done by them. This, it may be observed, can be increased but little without running in the night. The boatmen say that they could gain nothing by a relieve of horses, the locks are so frequent that the horse rests and feeds sufficiently.

It is further to be remarked, that the rail road wagons are loaded in or at the mouth of the mine from whence the coal is carried to the depot, and that as the boat cannot be brought to the mine, the expense of transporting the coal from the mine to the boat and unloading it into the boat is an additional expense incidental to the canal, and the waste of coal by this operation is also in addition; for these items not being precise data, $8 per ton are allowed. The labor of unloading the coal from the boat at the wharf is also greater than that of unloading from wagons, and a part thus handled must be shovelled on the screen, which is not required when the coal is unloaded from wagons; for this labor $10 per ton are estimated.

Estimate.—It is ascertained from experience that 2 good horses, with 4 men and 2 boys, will haul 100 tons of coal in 2 boats 100 miles on the Lehigh and Delaware Canals, and return in 12 days; hence 24 horses with 48 men and 24 boys take 100 tons in 24 boats 100 miles in 1 day and return.

To transport the same quantity 20 miles a day, or one-fifth of that distance, will require 48 horses, 9.6 men, 4.8 boys, and 4.8 boats. To simplify the calculation, 5 horses, 10 men, 5 boys and 5 boats, are supposed to be employed and the proper deduction made from the aggregate.

Capital Employed.

Five boats at $600 each,	$3,000 00
One fifth extra,	600 00
Five horses at $80 each,	400 00
One fifth extra,	80 00
Five harness at $6,	30 00
	$4,110 00

Annual Expense.

Interest at 6 per cent.,	$246 00
Repairs of boats 5 per cent.,	180 00
Depreciation of do. and horses 15 per cent.,	616 50
Keeping 5⅓ horses at $20 per year,	625 00
Wages of 5 men at $1 per day, (250 days)	1,250 00
Wages of 5 men at 90 cts.	1,125 00
Wages of 5 boys at 75 cts.	937 50
	$4,979 00
As 5: 4079.60 : : 4.8:	4,760 42
Unloading wagons from mine to boat, and waste 8 cts. per ton,	400 00
Additional expense for unloading boats and screening $10,	500 00
	5,660 42

Which—5,000 = $1.13.11: or $1.13⅕ per ton for 100 miles.

The above statements are made from actual performance on the rail road and canals referred to, and the expense thus ascertained *for transporting* on the canal, viz.: 95⅕ cents per ton for 100 miles, is almost precisely the same that is paid for boating coal on the Lehigh and Delaware canals, exclusive of the charge for loading and unloading, which is paid for in addition.

Yours, &c. I.

OXALIS CRENATA, *a new culinary vegetable.*

From the New England Farmer.

"This plant is cultivated abundantly in the gardens about Lima as a salad, for which purpose its succulent stems and acid flavor seem strongly to recommend it. It grows freely in our open borders, is readily increased by cutting as well as by its tubers, which require to be taken up and preserved from frost in the manner potatoes are. The tubers are produced in considerable plenty, and are often two inches long, and an inch in diameter. When raw they are slightly sub-acid; but on being boiled they lose this acidity entirely, and taste very much like the potato, for which they might form an agreeable substitute at the tables of the curious."

The following additional details, the result of further experiments, are from the pen of James Mitchell, Esq. under date of January 10th, 1833:

"I was one of a party where some tubers of this plant were cooked, by boiling for ten minutes, and they were on trial, declared by all present to be more agreeable in their flavor than the common potato. It is not possible to give an idea of the flavor in words; but if I were to attempt it, I should say it was that of the potato slightly combined with the chesnut. I have been informed that the tuber of the oxalis crenata was brought from South America by Mr. David Douglass, and was planted in 1831, by Mr. Lambert. One of the tubers obtained from Mr. Lambert was planted by Mr. Hirst in a pot in the green-house, in the end of April last, and in the month of May, the pot was removed to the flower garden, and broken, and the parts removed. It was first planted in the green-house as a security against frost; but this appears to have been unnecessary, as the plant has stood the frost remarkably well, and the leaves on the 5th instant, before the tubers were dug up, were quite green. The tuber planted was less than an ounce in weight, and the tubers produced were more than ninety in number, and weighed altogether upwards of four pounds. They were in a space the diameter of which was nine inches and the depth six. The stems were between twenty and thirty in number, succulent, and of a reddish color. The flowers appeared in August, and consisted of five petals, crenate at the edge, and of a yellow color. The leaves are trifoliate; the leaflets are inversely heart-shaped.

"The experiment of cultivating this tuber may be considered as hitherto very successful, and when we consider that the common potato was long confined to gardens, producing roots which were exceedingly small, and was far less promising than the oxalis crenata at present appears, we may reasonably anticipate that it may prove a valuable addition to our culinary vegetables, and that by skilful management the tubers may be greatly increased in size."

CLOVER SOWED AMONG CORN.

Extract from the American Farmer.

An experiment of this kind was made very successfully by a friend of mine, who sowed red clover among his corn; after going through with the cultivator the last time, the seed was protected from the heat of the sun by the corn, it consequently vegetated very soon, and after the corn was cut off, there was a luxuriant growth of clover, which afforded fine pasture for several successive seasons. The red clover is an excellent manure. I have raised a fine crop of wheat, by ploughing in the second growth after harvest; it is probable it may not suit the climate or soil of your subscriber, if so there may be other grass more congenial to it, which would answer the same end.

EXTIRPATING RATS AND MICE.

From the Farmers' Journal.

Lay bird lime in their haunts, for though they are dirty enough in other respects, yet being very curious of their fur, if it is but daubed with this stuff, it is so troublesome to them, that they will even scratch their skins from off their own backs to get it off; and will never abide in the place where they have suffered in this manner.

RICE MILL.

From the Boston Courier.

Among the inventions and improvements of the age, the patent Rice Mill is destined to take an important rank, whether it be considered as a labor saving machine, or as a means of giving increased value to an article of food. This Mill was invented and patented by a gentleman of Northampton. John Prince, Esq. of Roxbury, has recently erected one at South Boston, which is now in operation, and completely justifies the expectations of the proprietor. The process of hulling and cleansing Rice, as practiced in the rice-growing regions, has always been expensive, troublesome and *imperfect*. It is performed at Mr. Prince's Mill with great rapidity, and to a degree of perfection that will establish the value of the article beyond comparison, above that cleansed in the ordinary way. The machinery is moved by steam power. The grain is placed in the mill in its rough state, and passes through the various stages of the hulling and cleansing process, from hopper to hopper, without the intervention of manual labor of any sort, till it is delivered in its most perfect condition, fit for use. There is a separate mill for grinding the grain into flour.

We understand that the patentee has erected, or is about erecting, one of his mills at Wilmington, and another at Charleston. There is no doubt that it will speedily supersede the present mode of preparing rice for the market, which is by pounding.

When it is considered that rice furnishes not merely a cheap and wholesome food, but enters into the composition of many of the luxuries of the table as a principal ingredient, this improvement must be viewed as one of great importance, and the enterprising proprietor of the mill at S. Boston may claim consideration as a public benefactor.

DESTRUCTION OF CROWS.

From the Magazine of Natural History.

It is stated in one of the Perthshire newspapers, that not less than 27,000 crows were destroyed this season at Dupplin by the demolition of between 11,000 and 12,000 nests; and all this was performed by contract for the sum of twenty-five pounds sterling.—[Anon, June 25, 1833.]

In opposition to the spirit of persecution displayed in the above remarks, against the rook, and other birds—"vermin," as the writer calls them,—we present a short extract from a notice of some length, on the usefulness of the rook, which has been published in the Magazine of Natural History, vol. vi. pp. 142, 143.

"In the neigborhood of my native place, in the county of York, is a rookery belonging to Wm. Vavasour, Esq., of Weston, in Wharfdale, in which it is estimated that there are 10,000 rooks, that 1 lb. of food a week is a very moderate allowance for each bird, and that nine tenths of their food consist of worms, insects and their larvæ; for, although they do considerable damage to the fields for a few weeks in seed time and a few weeks in harvest, particularly in backward seasons, yet a very large proportion of their food, even at these seasons, consists of insects and worms, which (if we except a few acorns and walnuts in autumn) compose at all other times the whole of their subsistence. Here, then, if my data be correct, there

is the enormous quantity of 468,000 lbs. or 209 tons of worms, insects and their larvæ, destroyed by the rooks of a single rookery: to every one who knows how very destructive to vegetation are the larvæ of the tribes of insects, as well as worms, fed upon by rooks, some slight idea may be formed of the devastation which rooks are the means of preventing."

EMANCIPATICN POLICY OF GREAT BRITAN.

From Napier's late work on "The Colonies &c."

'An expedition having been sent to act along the coast of America, in the year 1813; it was observed that the cruelty of the masters to their slaves had produced, in the latter, such despair that they were ready to revolt. And, that by taking advantage of this spirit, we might have shaken the confederation of the United States to its very foundation; but to accomplish this, it would have been necessary to change our predatory, I must say, on some occasions, not very creditable attacks, into a general plan of hostility, that would have produced decisive results. The plan proposed, was to land a great number of officers, with black non-commissioned officers, and privates of the West India regiments, who would assemble the revolters in Carolina, Maryland, and Virginia: these States are said to contain about a million and a half of slaves; and out of these we might probably have formed a force of two hundred thousand able bodied soldiers, perfectly obedient, and detesting the enemy: with these, united to whatever British force might be sent to join them, we could have seized the whole of the Delaware Country; fortified the Isthmus between Elkton and Newport, and landed cannon from our fleet, which, divided into two large squadrons, would sail, the *one* up the Chesapeake Bay; the *other* up the Delaware River, and thus sustain the flanks of the army.'

'Such a force, and so placed, close to the enemy's capital, must have brought the whole of the American regular forces, tumbling down from the north, hotly pursued by our Canadian army, with which, at that moment, they were fiercely engaged. This plan of campaign involved considerable, but not insuperable, difficulties; the chief of these were:—

'1°. The formation of the black army.'

'2°. The feeding and other supplies.'

'3°. The throwing up the lines.'

'On which three points it was observed,'

'*First.*—That this spirit of animosity which inflamed the blacks, would in those countries, where the white population is so thin, enable such a vast body of slaves quickly to assemble, that for a long time the American forces could not be collected in sufficient numbers to attack the revolted negroes. The latter are perfectly acquainted with the country, and while accustomed to undergo every hardship, well knew where all the provisions were to be found. The negroes are patient of discipline, proud of being soldiers, quick to learn military movements, and brave. They would have been placed between the sea and the gallows; strong stimulants to make men fight.'

'*Secondly*,—The whole American coast is full of provisions; all must have fallen into the power of the blacks; the white population must have fled in terror; a large British fleet would have supplied arms and ammunition.'

'*Thirdly.*—Where wood abounds, defensive works are not difficult to form; the negroes are strong, and inured to severe labor; an army of such men can, by their labors, produce extraordinary effects in a short time. We know what Cæsar did between Jura and Geneva, and at Alesia. If Wellington worked more slowly at Torres Vedras, it was because he was waging war against a superior force far in front; had his lines been his primary, instead of his secondary, object, he would have put a great force of men to work; and the relative merit of rapidity in their construction would have been added to his renown. These are all great examples, and might have been followed in America. Assuredly they could, and the result of having such an army entrenched close to the capital, would probably have obliged the Americans to make peace.'

'Why, then, was not this plan adopted? Two reasons were given as conclusive against it.'

'1°. That we should not know what to do with this army of Blacks when the war was over. An objection much too foolish to require an answer'

'2°. That it would give a bad example to our own slaves in the West Indies. This was the true reason, and in it we behold the timidity of conscious injustice, and its invariable weakness. Some good people, also, trembled for the throats of the American slave-holders, but on their account there was little to be apprehended. There were ample means of preventing a general slaughter of the whites, but if, in a few instances, some murders should have occurred, for in war blood must be spilled, still the real authors of such a misfortune would have been those who *made*, not those who *freed* the slaves! Had the above project been adopted by the British Ministry, America would probably have made peace; on unfavorable terms for the moment perhaps, but she must eventually have become more strong, as slavery would have been rooted out for ever from the land, to which it is, if possible, a greater disgrace than to any other; a disgrace that most Americans are ashamed of: they feel that it is not very consistent to hear the Carolinians in the slave-market of Charleston haranguing upon liberty and equality!'

'We shall, probably some day, have a war with America, and if that day dawns upon a million of black slaves there, woe to Carolina, Virginia and Maryland! either the justice of the British people, or the gallantry of the blacks themselves, will soon free England from the infamy of this accursed traffic; and, when we have no slaves ourselves, the British Government will think it very right to excite the American negroes to revolt. Slavery is to America, what Ireland is to Great Britain, her weak point, and the game which France may play against England, England will play against America.'

'America has, however, one great advantage over England, her slaves are but one million. The Irish are *seven*, whose sufferings are daily increasing; they desire to separate themselves from England. "But since the Coercion Bill, she is quiet," say many people; yes, she is quiet, and so is the powder magazine at Woolwich!'

[The foregoing extract appears in the last number of the Westminster Review, without comment—and

therefore, it may be inferred from the reputation of that Journal, as well as from that of the author quoted, that the scheme there described was actually planned, and merely *not* attempted, because the execution was deemed detrimental to English interests. The statement presents a piece of secret history especially deserving the attention of the agriculturists and slave-holders of the Southern States. If the scheme had been attempted, it might have produced great evils—but its failure would have been as signal, as the iniquity and folly of its contrivers. If the subject was not so serious, the cool and straight forward manner in which the author treats it would be calculated to amuse the reader. With all the intolerance of a bigot and a partizan, he so hates negro slavery, that he deems any means right and proper that oppose it. But your thorough philanthropist is not daunted by the greatest conceivable amount of human misery that may possibly serve to promote his favorite schemes for increasing human happiness. There are unfortunately many fanatics in our own country, who equal Col. Napier in this respect, as much as they are beneath him in others.

For this, and for other extracts from the Westminster and Foreign Quarterly Reviews, we are indebted to the republication of those valuable periodicals by Condy Raguet, Esq. of Philadelphia, who has thus favored the reading public by furnishing those works at less than half the price of English copies, and with more speed and certainty of delivery, than could possibly be effected from abroad. It is gratifying to learn that the value of this republication has been properly estimated by literary men, and that the public spirited publisher will be rewarded for his undertaking. Articles in the Westminster Review especially (as the foregoing extract for example) are often decidedly opposed to the opinions, the acts, or the interests, of the people of the United States. Nevertheless, good policy requires that we should know what our enemies say of us, if they are intelligent, and their writings have extensive influence; and our countrymen will have but small opportunity of being instructed, who are too sensitive to read any thing that is opposed to their self-love and national prejudices, or even to their most correct opinions, and most valued institutions.]

ON PINE LEAVES AND OTHER WOODS' LITTER, FOR MANURE.

To the Editor of the Farmers' Register.

Amelia, March 15, 1834.

Since the first number of the Register was published, I have looked anxiously to see, if some one, qualified by his own experience, would not give us his thoughts on, and practice in, the use of litter from the woods, as a material for manure. But as no one has done it, and as I hold, that every thing done by a farmer, for the improvement of his land, (as soon as in his opinion it is worthy of imitation,) should be considered common property, I send you this communication on that subject. And if it should be the means of improving one single acre of worn-out land, I shall consider the time bestowed in writing it, as well spent.

For three years, I have been in the habit of using pine *tags* as litter in my farmyard, and occasionally in my stable, both in the winter and summer; and have been enabled, by that means, to manure more than double the land, with the same hands, I could have manured with the litter from the crops, unaided by that resource. As to the cost of raking, hauling, &c., I consider it so small, as not to be worth mentioning; for this is done, generally, when the ground is too wet to do any other work. The horses and hands must be fed, whether they work or not. The benefit of this, as raw material, must, of course, depend on the distance which it is to be hauled to the farmyard, and the quantity and quality of the manure it makes after you get it there. In the present state of our country, every farmer above tide water, should think his manure a subject of very great importance. He should not only use all means to make it, but should so arrange his fields, as to afford every facility in applying it. To ensure a supply of litter, I have kept a body of pine woods within a few hundred yards of my standing pen, into which a single cart, can, in a day, bring twenty loads of litter, when properly attended to. This quantity of litter, with the dung from twenty-five or thirty head of cattle, would top-dress three acres of land for wheat or clover, in four or five weeks. But if the pen was broken up, or loam from the corners of fences thrown over it, before the litter was put on, the quantity of manure would be much increased: for then the earth would absorb the urine and rain-water, which might otherwise pass off—and no top-dressing, that ever I have tried, is better for wheat or clover, than the earth itself so saturated. To dig up loam, and bring it to a standing pen, may be thought too troublesome by many; but those farmers, who admit the word *trouble* in their vocabulary, are not likely to do much, in the present state of things, for our worn-out lands.

I make three parcels of manure each year. The first of November, or as soon as my wheat is sown, I begin to haul litter to my standing pen, and put my cattle on it. It often happens, that there is no necessity for feeding them, until the first of December; but whenever it becomes necessary, I begin with straw, shucks, &c., reserving the corn-stalks for a future occasion. During the winter, I take every opportunity of increasing the quantity of litter in this pen, and never haul any out until the first of March. I then carry the whole on the field I mean to fallow in the summer, or fall, for wheat, and scatter it on the land. I used to apply this half-rotted stuff to the field I was preparing for corn. I will never do it again. As soon as I begin to take off this winter crop of manure, I bring on the corn-stalks; as they will perform the double duty of food and litter. In this way, by the last of March, all the manure made during the winter, is carried on the land, and the same pen again deeply covered with stalks and litter from the woods. My reason for using the corn stalks at so late a period, is this; that in making manure during the summer, we should carefully avoid excessive fermentation in the first place, and hasty rains passing through the litter, and carrying its most valuable qualities off. With stalks thickly spread, the last injury is seldom felt, and they are less liable to loss from the first, than any thing I have ever used. The cattle are kept on this pen until July, when I clean it up and carry its contents on the same field. Some short time before the manure is moved from the second pen, I make a pen in the fallow field, or as near it

as I can, and litter it almost exclusively with pine tags—(you must allow me the use of this term) on this, the cattle are kept until November; and the manure made, is used as top-dressing for wheat. All my efforts have been directed, for three years, to the crops of wheat and clover. I apply my manure to the surface, at the rate of a one-horse cart load to seven yards square. You will see, that I never use the litter, without first penning on it, nor pen the cattle without the litter. I cannot illustrate my idea of the use of either of these means of improving our land taken singly, more aptly, than by supposing a person to be so opposed to labor of every kind, that he would stick pieces of raw cotton over his body, and assert, "that cotton so used, formed a most comfortable shirt." My land was laid off in four fields, some years ago: but as I had it all to clear, the fields were so small, (and indeed are now,) as not to entitle them to that distinction; containing not more than thirty acres each. This plan was adopted, that one of these little fields might be fallowed for wheat; and it was thought, that if the field to be fallowed could be manured, good crops might be expected; and that the land would certainly improve. In the commencement, I was so much afraid that the field for corn would be reduced too much by that crop, to bring good clover, that I applied the manure I then made to that crop; and by that act of folly, lost half its value. I am now, as stated above, putting it on the fallow field, all of which, I do not expect to manure, as I have been able, hitherto, only to get over about twenty acres a year. The last crop of wheat was the only one from which I could have formed a just estimate of my plan, (which is the one lately recommended by Mr. Carter.) And although it was destroyed by the unfavorable season, and the fly, yet it proved to me, beyond a doubt, that the quality of my manure was good. During the whole spring, the crop on the manured land looked fifty per cent. better than it did on the land adjoining; and at harvest, the difference was as strongly marked. To facilitate the carriage of the manure to each field, they were so arranged, as to meet at the farm-yard; by which means, its contents would never be carried through one field into another; nor would it be carted a greater distance one year than another.

When I first resolved to improve my land from the farm-yard, I began with the plan recommended by Cobbett, in his work on gardening—which is, to place layers of different manures, and loam, alternately, on each other. In this way a mound is raised which is to be covered entirely with loam, when it is finished; and to remain with this covering unbroken, until a short time before it is to be used. It is then dug down and mixed from top to bottom; and in a week or ten days after, is delightful dressing for every plant on which I have ever tried it. The labor of bringing the loam together, (after the corners of the fences near the heaps had been exhausted,) induced me to use litter from the woods. In my situation, which is peculiar, more manure can be made from the woods, in the same time, than could be made on his plan, and therefore I have abandoned it. It might be practised with great profit on many farms in this county; on those, especially, on which there is a scarcity of woodland; and this remnant the owners are cutting down. The same hands can manure double the land they can clear, even under bad management. I know this to be a fact from my own experience; and I think I follow the best rule that ever has been given on that subject, that is, to keep sharp grubbing hoes and axes, lose not a moment, and, when at work, to *lay on* with all your might. The small size of my fields obliges me still to clear as much land every year as I can; though that is but little, for the hands I work are not equal to four good negro men. If the time occupied in clearing was taken up exclusively in making manure, I am sure, I would get over thirty acres with more ease than I now do twenty. I have mentioned the size of my fields, and the labor bestowed on them, for this reason—that when a system of improvement is recommended by a wealthy man, those whose farms are small, and force weak, think they have no part in the matter—and that he is able to do this thing from his superior means. Now the people who are most benefitted from such a plan as Mr. Carter's, in proportion to means, are the small farmers; a class of citizens so respectable, that to be one of them, I have always been well content to be a diminutive myself.

My fields are well set in clover, and have been sown as soon as each succeeding clearing had been in cultivation sufficiently long to receive it, though they have not received the full benefit of this inestimable grass. The number of hogs sold in Virginia from the Western States, induced me to try and set my neighbors an example, that, if followed, would at least exempt us from this tax. With this view, I increased my stock of hogs; and as I wanted to prove, that any quantity could be raised without corn for six months in the year, I was obliged to graze them on my clover, from the 20th of May, until they came to the fattening pen. They gleaned the wheat field after the crop was taken off. The experiment succeeded admirably. Mine is not what is called corn-land, but I consider the product, one year with another, four barrels to the acre. I am very much pleased with the appearance of the growing crop of wheat; and if every head of it is injured by an unfavorable season, I should continue my plan. It may not be improper to state, that I have no fear of sorrel from pine tags, when used as litter for stock. I top-dressed a small piece of sorrel, (all I could find) on land also well set in clover; and the clover had nearly extirpated it, early in the summer. By the way, as a word at parting, more Irish potatoes (good food for man and beast,) can be raised under a covering of pine tags, than I have ever seen raised in any other way, and the quality better. My cattle never run on my cultivated land, but graze the deserted fields around me, which are very extensive. In their office as scavengers consists their principal value, though they furnish an abundant supply of milk, butter, and beef, and (as you may well suppose under this management,) of *leather* too. Very respectfully,

JOHN P. BOLLING.

For the Farmers' Register.

ON THE NECESSITY, AND MEANS, FOR LEGISLATIVE AID TO AGRICULTURE.

I have been much gratified in reading the various pieces which have appeared in the Farmers' Register, calling on the Legislature to extend the aid of government for the improvement of agriculture. But the gratification was caused, altogether,

by observing such indications of growing public opinion--and not in the slightest degree from supposing that such appeals to members of the legislature could have any direct effect. The members of the General Assembly of Virginia, are peculiarly the agents of their constituents. It may be questioned, whether this is more owing to any peculiarity of our form of government, or to the stubborn independence of the body of the people; but the effect is not the less certain. Our representatives do not lead, but follow, the wishes of their constituents. Whatever talent and boldness a member may display, in advocating any new measure, is, in general, merely a zealous performance of the wishes—or expression of the feelings of his constituents: and if one dares to precede his countymen in making an important decision, whether he is right or wrong, he will, in most cases, thereby incur their displeasure, and forfeit his place as their representative. This state of things is accompanied with many good, but also, with some inconvenient effects—and one of the latter, is, that the legislature must always act as if behind the people in intelligence, and wait for the popular impulse to direct every new and important public measure. The members certainly possess, and exert, great influence in producing such measures—but they use this influence at home, and in their private character—and not as legislators, until they feel assured that they will be sustained in, (if they are not urged to) the course, as a matter of state policy. Entertaining these views, I believe that if every member approved the changes proposed in our legal policy by different contributors to the Farmers' Register, for the benefit of agriculture, that no such enactments would be made, nor even proposed in the legislature, until the people had been induced to think, and were ready to act, on such subjects. Let us then address ourselves to the *people*. Let every man, who wishes the adoption of any legislative measures for the aid of agricultural improvement, use his influence among his neighbors, as well as by publication; and there can be little doubt of the success of what is so reasonable in itself, and promises such general and important advantage to the commonwealth, and to every individual tiller of the soil. Let us set on foot agricultural societies, if possible, in every county, so constituted, as to engage the interest, and secure the co-operation of farmers of every class—and through them, let the wants of agriculture be ascertained, and made known to our legislature. The agricultural interest in Virginia, and the people, are the same body. The advantage of the one, cannot, by possibility, be made injurious to the other—and agriculture has only to know and declare her wants, to meet with prompt and implicit obedience. If the sum of ten thousand dollars a year was appropriated to aid the improvement of agriculture, every cent would be drawn from the pockets of the same class that would receive the benefit: and to whatever extent such appropriations may be made, it will only be a use, made by the great body of the people, of their own money, for their own advantage. Heretofore, the agricultural interest has been taxed for the support of every other—directly or indirectly—by the state, and (far more) by the federal government. But though the agricultural interest pays all such taxes, and all cost of protecting other interests, and possesses the power, as well as the right, to direct, restrain, or refuse all such grants, not the smallest pittance of this lavish bounty has been yet bestowed on agriculture itself.

I shall exhibit in a series of short articles, (to which this is introductory,) my views on the various subjects which require legislative interposition for the benefit of agriculture, in Virginia. In aid of this effort, I earnestly invite others, who entertain the same general views, even though we may differ as to particular objects. I shall not offer any general plan; but will consider the elements out of which a general plan may be formed: and without being very choice as to the comparative values of the means, I shall be satisfied with the adoption of any that will serve to bring forth, embody, and make public, the opinions, feelings, and supposed interests of the great body of the agriculturists of Virginia. If this can be done, nothing will long be wanting that legislation can supply. My object is, to induce reflection and discussion upon this important subject—and therefore, every important aid to agriculture, which government may use, will be separately named, without undertaking to decide on their comparative value and importance. And as the means are many and distinct, I shall be gratified if other correspondents of the Farmers' Register will aid and lighten the labor, by setting forth their views on any of these means—which in my opinion, are the following:

1. County Agricultural Societies, so constituted, as to embrace the great body of practical farmers, as well as all other friends to agriculture—each society to receive from the treasury of the state, a certain sum, in aid of its objects; upon the condition, that as much more has been paid by the individual members.

2. A Board of Agriculture, to be composed partly of delegates, chosen by the county societies, and partly of members appointed by the state executive—which, besides performing the service of a state agricultural society, would report to the legislature whatever was required for the relief, or promotion, of agricultural interests.

This general organization would serve gradually to bring forward every measure that would be desirable and important. But, (in pursuance of my object of inviting reflection and discussion,) I will state some of the most important means which might be used to improve the practice, and extend the knowledge of agriculture.

3. Agricultural schools, in which both the principles of the science should be taught, and the actual labors performed. Possibly, a professorship of scientific agriculture might be advantageously added to the University of Virginia.

4. Premiums to be conferred according to a general system, to be fixed by the Board of Agriculture—the premiums to be given for such experiments, or operations, as served to establish valuable truths, or to remove errors. Any appropriation for this purpose, *properly* bestowed, would return a tenfold remuneration to the community.

5. An experimental farm—which necessarily would be attended with far more cost than pecuniary profit, even though the results of the experiments might be of incalculable value to agriculture.

6. A model, or pattern farm, on which no experiments should be made, but only a well tried and approved system carried into effect, with the best means, and in the most perfect manner.

7. The general dissemination of periodical publications on agriculture and rural economy.

R. N.

ON THE PROPER CONSTRUCTION AND FIXING OF WATER RACKS, SO AS TO PREVENT ANIMALS FROM PASSING THE WATER GAPS.

From the Southern Agriculturist.

"*Rockey Grove, Abbeville District,* }
July 1, 1832. }

Dear Sir,—The upper part of South-Carolina being very hilly, and the rivers, creeks, and small branches, or runs of water, finding their way to the ocean between hills of considerable height and steepness, the natural consequence is, that after every rain the smaller creeks and branches rise so rapidly and so high that no fence built across them can be kept up. From this feature in the face of the country, another consequence is, that so many small branches or runs of water exist throughout it, that there are few planters or farmers to be found, through some of whose fields these water-courses do not pass. As fences cannot be kept across them, and as it would be not only very laborious to build fences on each side, but destructive to the rail-timber, and prevent much valuable land from being brought into cultivation; the agriculturists of the upper country adopt the plan of building their fences only to the edges of the water-courses, (commonly called water-gaps) at the spot where they enter and pass out of the field, and then close these water-gaps, by hanging racks across them, the rounds of which, whilst they are placed sufficiently near to each other to keep out hogs, yet let the ordinary water and much loose trash pass between them. But from the great and rapid rise of the water after a rain, large logs and dead trees are brought down these water-courses, which but too often sweep away these racks, and often the logs also to which they are hung, and thus, as well as by sometimes lodging under the rack and preventing it from swinging back to its place, or in some other way leave an opening, through which, hogs especially, and sometimes perhaps, other stock get into the fields. This inconvenience, (or rather evil,) from sad experience, I know to be great, for I have no less than six of these water-gaps to combat with, and will soon add two more and it requires the experience of years to enable an upper country planter or farmer, (especially one who has recently become so from having lived the early part of his life in the lower country, the flatness of which exempts them from this perfect pest,) to give to these water-gaps even a tolerable degree of security against hogs.

When I first settled up here, I listened with some surprise to the account of difficulties my kind neighbors told me my water-gaps would give me; but I soon found that these water-gaps were something more than bugbears. I adopted the plan recommended to me of fixing the logs to which the rack were to be suspended as high as I well could, that the drift timber might pass under them, and their raising the racks swung to these logs, pass under them also, permitting my racks to swing back to their places. Alas! my water-gaps continued for years to occasion me no little vexation, trouble, and some loss; and at last, and not until within a year or two back, I found I had gone exactly the wrong way to work.

One of the most intelligent and respectable of my neighbors, who to use his own language, "had "served an apprenticeship all his life in *trying* to "make water gaps secure against hogs," told me, upon hearing me utter some doleful complaints against the unfaithfulness of my water-gaps; "Instead of fixing your logs or timber to which your "racks are hung *high*, you ought to place them as "*low* as possible; for by so doing, from the rapid "rising of the waters your log will be covered be-"fore the creek has risen high enough to float this "drift lumber from the place it occupies, which "will, therefore, when it reaches your water-gap, "pass harmlessly over log and rack; whereas fix "your log as high as you may, you can hardly ex-"pect to get it out of the reach of high freshes, and "even if you could, some one piece or other of the "drift timber in passing under your rack, will at "times be caught by it, or the vines by which it "swings by a limb or prong, which will stop more "timber and form a raft whose weight forced on "by a rapid current will tear away your rack, se-"cure it as well as you may," &c. &c. We then discussed at length the best mode of preventing hogs from pushing aside the rack sufficiently to get into the field, or from getting under it by raising it, or diving under it, &c. during which conversation I got much useful information, which has enabled me since, much better than formerly, though not altogether, yet, to make my water-gaps *tolerably* secure.

As one of the objects of your useful journal is to enable some to avoid "wasting their time and "labor in endeavoring to discover what others al-"ready know," I will tell you how, after eleven years experience, I have been best able to secure my water-gaps, even at the risk of being thought a very dull fellow from not purusing my present course from the very start. A rack for a water-gap should be made, the bottom and top pieces of *green* timber, and not too heavy, the rounds of *seasoned* heart oak-timber, if to be had. To make a water-rack, (the common phrase) procure a young *oak* tree of the length and size wanted. If you are very nice about it you may square it with a broad-axe, or only flatten two sides of it with your axe and carry it to the water-gap; there bore holes through it with an inch and a quarter, or an inch and a half auger, four and a half inches apart from centre to centre, then split it open so as to form the top and bottom parts of the rack out of it. After you have put in the rounds, wedge each one well both at top and bottom, and let them be of such a length that when the rack is finished, it will be from top to bottom three feet high. A water-rack ought not to exceed 20 to 25 feet in length; if the water-gap is wider than that, make two racks, and in swinging them, lap one about two feet over the other, but do not fasten them together, unless your hogs have become so knowing as to force their way between them, for the easier and lighter your rack swings the more likely is it to answer its purpose. The log or piece of timber which you intend to lay across the water-course to swing the rack to, should be a good stout one, should not be more than eight inches or a foot above the top of the rack, should *lie level*, and the ends be well weighed down with rock, or otherwise secured to prevent the water when it rises from carrying it off. If the banks of the water-course are high, sink the ends of your log or piece of timber

in them, which should be laid across the stream as low as possible, so as to allow the rising waters quickly to get above it; for when that occurs, the danger of losing your rack or log is greatly lessened. Swing your rack by tying it to the log in at least three places. If you use grape or muscadine vines for this purpose, do not twist them as you would do a hickory withe; if you do, they will last but a short time. Your water-rack at the upper water-gap, where the stream enters the field, must *not* rest on the bottom, whilst your water-rack at the lower water-gap, where the stream passes out of the field *should rest* on the bottom, so that the rack will hang with its top a little higher up stream than its bottom. If you or your neighbors own any *learned* hogs, drive down between the two rounds of the water rack next to the bank of the stream, a stake, in size one-third less than the space between the two rounds, firmly into the bottom of the water-course, and tie it at the top to the log to which the rack swings, but do not let the top of the stake be any higher than the top of the log, or it may stop some drift timber, form a raft, and away goes every thing: this stake will prevent the hogs from pushing the rack one side and passing through the gap. To prevent hogs from entering your fields by raising the rack, weigh it down by securing to the bottom of it a green log, but do nothing to it, which will prevent the rack from floating or rising as the waters rise, or it will be carried away by water soaked logs, which are swept along at the bottom of the water-course, &c. If the hogs dive under your rack where the water is too deep to allow you to sink your rack sufficiently deep to stop them, which some become sufficiently learned to do, tie a green log to the bottom of the rack, and let it hang down, leaving from four to six inches between it and the rack, into which space the hogs will run their snouts, become perplexed and turn back. But do not resort either to the stake or green log unless it becomes necessary, for the freer and lighter your rack swings the better.

A water-rack if made out of the materials above directed will last very well for two years, but do not trust to it the third, or you may rue it. If you discover an old sinner climbing over your water-rack, shoot it—shoot it, no matter whose hog it may be, for such a one is *hostis humani generis*. Be careful after every rise of the water-course to examine your water-gaps, for your hogs will search it if you do not, and if they once find their way into your fields of grain by the water-gap, it is very difficult afterwards to keep them out. As simple as all this seems, it would have been very useful knowledge to me, when I first took charge of an upper country plantation, and so may perhaps be useful to some one else. But as I have not yet been able to make my water-gaps perfectly secure, perhaps some of your readers may know how to fix them better than I do, for information on which subject I should be thankful.

Yours, respectfully, THOMAS PARKER.

BEET-ROOT SUGAR.

From the Quarterly Journal of Agriculture.

It is well known that, during the latter years of the late war, in consequence of the French colonies having been captured by Great Britain, sugar was manufactured in considerable quantities in France, from beet-root; indeed, nearly the whole consumption was obtained from this source. During the war the manufacturers flourished, but as soon as the peace of 1816 took place, and caused the sudden introduction of West India sugar through Holland, they were ruined by the comparatively low price at which the foreign sugars were introduced, in consequence of the necessity which the government felt of relaxing its rigorous decrees against foreign commerce. As, however, the price of foreign sugar rose again after the peace of Europe was established, several of the old beet-root sugar manufactories of France were re-opened, and profitably worked, as the supply of the French colonies was not adequate to the increasing consumption; and the duty upon the foreign growth being about $3\frac{1}{2}d.$ per pound, whilst the sugar made in the French colonies was also charged with a duty of about $1\frac{1}{3}d.$ per pound. The manufactories are daily increasing, and it seems probable that the consumption of sugar on the Continent will be soon entirely confined to that obtained from beet-root. One manufactory at Arras furnished, 1827, one hundred thousand kilogrammes of this article; and beet-root sugar seems likely soon to exercise some influence over the commerce of Europe. The consumption of sugar in France is estimated at about eighty millions of kilogrammes annually; and, if the home manufactory continues to receive as much encouragement as it has hitherto done, France will shortly grow upon her own soil, most of the sugar she consumes. In this country, the beet-root may be procured as cheap as in France; and as the cost of fuel for the manufacture would be much less, it would seem to be a profitable article of cultivation to the agriculturist, particularly as the sugar imported from the British West Indian colonies pays a duty of nearly $3d.$ per pound. After the juice has been extracted, the pulp is used for feeding cattle, for which it makes a good winter food. On the continent, the farmers mix a small quantity of flax-seed cake with the root, to make it more nourishing.

The manufacture of beet-root sugar is now perfectly established in France. In the departments of the Soame and of the Pas de Calais alone, there are above twenty establishments on a large scale making sugar. The cultivation of beet-root by the small proprietors of land for sale, to the sugar-makers, is a regular and common branch of husbandry; and, in those departments, if we are not misinformed, sugar is not only made on the large scale by the manufacturers, but by the house-wife of the farm-house, as a matter of domestic economy, requiring not more skill or trouble than cheese-making or brewing. In France, raw or Muscovado sugar is not so generally used in that state as in this country. It is more or less refined before it comes into domestic use.

The beet-root sugar-makers on the large scale, refine their sugars, therefore, and produce sugar which, for whiteness and beauty, is unequalled by the refined sugar we produce from West India raw or Muscovado sugar. Bulk for bulk, however, the refined West India sugar is sweeter than the refined beet-root sugar; but, weight for weight, they are equally sweet. A lump of refined beet-root sugar of the first quality is lighter than a lump of equal dimensions of refined West India sugar, probably because it is more pure and free from extraneous matter; but a pound weight of beet-root

sugar, differs from a pound weight of West India sugar, only in our receiving more of these lumps in our pound weight. If sugar were sold by the cubic inch, beet-root sugar, as compared with West India sugar, would be less sweet and less economical in use; but, being sold by the pound weight, it is, for domestic use, even more economical.

From five to seven per cent. of raw or Muscovado sugar appears to be the usual produce from a given weight of beet-roots. From a given weight of this raw sugar, forty per cent. of the finest white refined sugar, with fifteen per cent. of inferior refined sugar, appear to be the quantities produced; making about two pounds and four-fifths of a pound weight of the finest white refined sugar from each hundred pounds weight of raw beet-roots. The pulp from which the juice is extracted, and the other residue of the manufacture, are used for feeding cattle, and form a very important item in the returns or profit. According to M. Chaptal, the value of the molasses, pulp, &c. is sufficient to cover one-fourth of the expense of the manufacture. This value must of course depend upon the value of butcher-meat, and upon other local circumstances, which are at least as favorable in Great Britain as in France to the manufacture. It is not the least promising feature of the manufacture, in the eyes of those who promise themselves great and extraordinary results from it ultimately, that it is thus linked with the ordinary business of husbandry,—that it offers no excessive rate of profit,—that it operates upon a known root cultivated for feeding cattle,—and that the farmer, whether he raises beet-root for feeding cattle, or for sale to the sugar-baker, is cultivating a green crop, which, in his ordinary rotation of crops, he would at any rate raise on a part of his farm. The beet-root, it may be proper to observe, is the same plant which is cultivated in England under the name of mangel wurtzel. There are varieties of the plant having red, yellow, and white roots, but which appear not to be distinct varieties, as occasionally they re-produce each other. The white beet, having firm white brittle roots, is considered the most productive of sugar.

BEET-ROOT SUGAR.*

From the Quarterly Journal of Agriculture.

The manufacture of beet-root sugar in France has advanced so far, that it presents itself with all the intricacy and imposing development of old establishments, carried on with considerable capital and expensive machinery. It is no longer a collection of pots and pans, and tubs and vats, in the corner of an old barn, that constitutes a beet-root sugar-work in France. The processes of rasping and pressing are performed in many cases by steam engines and hydraulic-presses; and the boiling, concentrating, evaporating and crystallizing processes are very generally carried on by the agency of steam. At Coulonne, on the side of the canal, about four miles from Calais, is a sugar-work, upon a considerable farm, fitted up in the most approved manner. It is no wonder—no show-place in the country, there being at least five such establishments within a circle of thirty miles. At this farm is a beautiful steam-engine working the rasping machine, and two hydraulic presses, and a well-connected system of boilers, and condensing and evaporating vessels, all heated by steam. Beet-root is in much more general cultivation on the continent, as a cattle-crop, than turnips. Turnips, indeed, are seldom seen, except as a second crop, sown upon an early stubble, and yielding a small and uncertain produce. The plant itself affords a more substantial food for cattle than turnips; and, when cultivated with care, appears to give as great a bulk of food from a given space of ground as an ordinary turnip crop, and much more than a broadcast turnip-crop. The preference given to the cultivation of beet-root may arise, however, from the general state of husbandry, as much as from the particular nature of the plant. The country being, in general, open and unenclosed, cattle are of necessity stall-fed, day and night, and all the year round. Grass, that is natural pasture, does not, it may be said, exist at all; and, in fact, between the cold in winter, the heat in summer, the unenclosed state of the land under crop, and want of shelter, as well as of enclosure, when could cattle pasture? How many hours in the twelve months could sheep or cattle have the benefit of pasture, if pasture was there for them? Stall-feeding may be the best husbandry; but it is there one of necessity as much as of choice; and, of necessity, every piece of land must be brought under the plough, or left in a profitless state. The beet-root is better adapted for this state of husbandry than the turnip. It admits of being taken up in October, and pitted or stored for winter use, like potatoes. It is, bulk for bulk, a more substantial food than the turnip; and in spring, it is food when the turnip has ceased to be so. There are many varieties of the beet-root cultivated for cattle crops. There is beet-root entirely red, and entirely yellow, and entirely white; and white with red streaks, white with red skin, white with yellow skin, &c. Of these varieties, the entirely white is preferred for sugar-making: not as containing a great proportion of the saccharine matter than the other varieties, but as yielding a juice more free from coloring matter. Roots of a medium, or rather small size, not exceeding two pounds weight, and which creak under the knife, and present a hard and almost shining fracture when broken, are considered the most productive in sugar. The cultivation is so entirely the same as that given to a turnip crop, that it is unnecessary to dwell upon it.

* See Arcana of Science for 1831.

STEAM CARRIAGES.

From the New Monthly Magazine.

The select committee appointed last session of parliament, on the motion of Colonel Torrens, conclude their report with the following summary of the result of their inquiries:—1. That carriages can be propelled by steam on common roads, at an average rate of ten miles per hour. 2. That at this rate they have conveyed upwards of fourteen passengers. 3. That their weight, including engine, fuel, water and attendants, may be under three tons. 4. That they can ascend and descend hills of considerable inclination with facility and ease. 5. That they are perfectly safe for passengers. 6. That they are not (or need not be, if properly constructed) nuisances to the public. 7. That they will become a speedier and cheaper mode of conveyance than carriages drawn by horses. 8.

That as they admit of greater breadth of tire than other carriages, and as the roads are not acted on so injuriously as by the feet of horses in common draught, such carriages will cause less wear of roads than coaches drawn by horses. 9. That rates of toll have been imposed on steam-carriages which would prohibit their being used on several lines of road, were such charges permitted to remain unaltered.

DRY ROT.

By a Correspondent of the United Service Journal.

An officer of the navy, now dead, was informed by the Rev. G. Williams, of Rhicolas, in North Wales, that it had been found from long experience, that the water in the reservoirs for supplying the precipitate pits at the copper-mine works at Parry's mountain in Anglesea, has the property of preserving timber from decay and dry-rot in a surprising manner, by the short process of steeping it therein a few weeks only, and that it has such a powerful effect in hardening the wood, as to blunt the sharpest tools. It, consequently, is found necessary to shape and fit the wood completely for the use intended, before it is put into this water for seasoning.

The water at Parry's mine is impregnated with copper, sulphuric and vitriolic acids. It is preserved in large reservoirs for supplying the precipitate pits, which are filled with old iron that attracts the copper from the water.

It appears that the farmers, when they find their timber for agricultural purposes too green for immediate use, steep it for a few days in the copper-water, which has the power of extracting the sap, and fitting it for use properly seasoned.

I understand that a complete transmutation takes place in the iron, it gradually becomes incrusted with the copper, whilst at the same time the acids act as a corrodent; so that a piece of iron thrown in, after a certain time, comes out copper, but whether weight for weight, or size for size, I do not recollect.

The Admiralty, I believe, are in possession of this information; if, however, the present method of immersing ships and timber in sea-water is successful in curing or preventing the dry rot, we certainly cannot obtain a more easy or cheap method for gaining the desired end. The component parts of sea-water, common salt, marine magnesia, and salenite, are very dissimilar to those of the mineral waters of Parry's mine, and it will be curious if both, nevertheless, produce the same effect upon wood.

INSECTS.

From Jesse's Gleanings in Natural History.

"I will say a few words on winged insects, which, in "their origin and metamorphoses, offer the most extra-"ordinary known miracles perhaps of terrestrial na-"tures."

SALMONIA.

A lover of natural history cannot I think be a bad man, as the very study of it tends to promote a calmness and serenity of mind favorable to the reception of grateful and holy thoughts of the great and good Parent of the Universe. He cannot be a cruel man, because he will be unwilling wantonly to destroy even an insect, when he perceives how exquisitely each of them is contrived, and how curiously it is made for the station it is destined to fill in the animal world. Few things have afforded me greater pleasure than watching the wonderful instinct which induces insects to watch over and protect their offspring. An instance of this occurred under my own observation in the case of a sand-wasp. This animal was observed to fly backwards and forwards very frequently from the side of a window to a gravel walk near it. After some time it was perceived that she collected the finest particles of sand from the walk, with which, under a projection of the window, she formed a cell. When the cell was completed she flew to a neighboring bush, from whence she selected a little green caterpillar, which with some difficulty she contrived to force into the cell. Having next deposited an egg on the caterpillar, she covered over the top of the cell with a sort of paste made of fine sand, sloping it so that no rain could rest upon it. In this manner, four different cells were completed. After a lapse of some time the young wasps emancipated themselves and disappeared. There seems no reason to doubt but that the caterpillars which were so curiously introduced into the cells served not only to protect the young brood from too much heat or cold, which they would have been subject to, had they merely been deposited at the bottom of an empty cell, but also for food, till they were capable of extricating themselves from their state of confinement.

Another insect also of the *sphex* genus will dig a hole in sandy ground, drag a large spider, or the caterpillar of a *phalæna*, into it—lame it by biting off its legs—and then lay an egg in each hole; so that the larvæ may suck out the spinning-fluid of the animal which the mother has buried, and in that way prepare itself a habitation in which to pass through its metamorphosis.*

The following remarks on insects are selected from Blumenbach's Elements of Natural History, and may interest those who have not had access to his works.

"It has been calculated that the abdomen of the "female white ant, when about to lay her eggs, is "two thousand times larger than previous to im-"pregnation. She can lay eighty thousand eggs "within twenty-four hours. Insects which under-"go metamorphosis are called larvæ, whilst in "this state in which they escape from the egg. "They are mostly very small on their first appear-"ance, so that a full-grown caterpillar of the wil-"low-moth, for instance, is seventy-two thousand "times heavier than when it issues from the egg. "On the other hand, they grow with great rapidity, "so that the maggot of the meat-fly, at the end of "twenty-four hours, is one hundred and fifty-five "times heavier than at its birth.

"The carrion-beetle *(vespillo)* scents from a "distance the bodies of small animals, as moles, "frogs, &c. and buries them under ground for the "purpose of depositing its eggs. Six of them will "bury a mole a foot deep in less than four hours.

"The eyes of insects are of two kinds: the first "are large hemispheres, mostly composed of thou-"sands of facets, but in some instances of nume-"rous conical points, and covered on the inner "surface with a layer sometimes glittering, some-"times variegated. Those of the second kind are "simple, small and vary as well in number as

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* Blumenbach.

"position. Eyes of the first kind seem calculated "for seeing at a distance—of the second for look- "ing at near objects. Only a few insects can "move their eyes.

"The *antennæ* are organs of feeling, which are "of great importance to insects, on account of "their hard, insensible covering, and the immobi- "lity of their eyes. They appear to possess their "most acute feeling in the antennæ, as man has in "the tips of his fingers; and as for the most part "they live in darkness, supply the want of light "by this contrivance.

"The eggs of some insects are covered with a "kind of varnish, to protect them from the destruc- "tive influence of rain and other accidents."

It would however be an endless task, if I were to enter into all the wonders of the insect creation. Latreille says "that the wisdom of the Creator "never appears to excite our admiration more than "in the structure of those minute beings which "seem to conceal themselves from observation; "and Almighty Power is never more strikingly "exhibited than in the concentration of organs in "such an atom. In giving life to this atom, and "constructing in dimensions so minute, so many "organs susceptible of different sensations, my "admiration of the Supreme Intelligence is much "more heightened than by the contemplation of "the structure of the most gigantic animals."

ON THE EFFECTS OF TERRESTRIAL RADIATION ON THE PROCESSES OF VEGETATION; AND SOME ACCOUNT OF THE CHINESE METHOD OF PROPAGATING FRUIT TREES.

From Loudon's Gardener's Magazine.

It has been shown that the cooling process of radiation, by which the temperature of the surface of the earth is lowered so considerably, differs materially on the inclination of the hill, compared with the bosom of the valley. Mr. Daniell, indeed, states, on one occasion, a difference amounting to 30°: that is to say, the thermometer on the inclined surface maintained a higher temperature by 30° than another placed on the horizontal or level plane of the adjoining valley. This difference is certainly enormous; but it is proved beyond a doubt, that a slope, and inclined plane, for instance, radiates less, by many degrees, than the surface which is altogether horizontal. Indeed, I think, we may collect abundant proof of this important fact among the mountains and the valleys of Italy. On the plains of Piedmont, the vines, which are suffered to attain a considerable altitude on lofty poles planted as their support, are detached from these poles toward the approach of winter, and prostrated on the earth, where they are secured from injury by the straw. This treatment protects them from the effects of the intense, though short winter, which reigns on the plains of Piedmont; for, even at Turin, the water in my room has been congealed into a solid mass of ice throughout its entire extent. The olive succeeds in Tuscany, but the almond, pomegranate, and plants of the Citrus family, flourish but imperfectly; and yet on the acclivities of the ampitheatre of the Appenines, which form a semicircle round the magnificent city of Genoa, you find that the pomegranite, the lemon, and the orange, mature their fruit and luxuriate. Even the imperial city is indebted for her palm branches to the palms which succeed in the open air at Nice. Now the only difference in these circumstances consists in a reduction of the loss sustained by radiation, and the attempered influence of the sea-breeze, which more than counterbalance the increase of warmth imparted by the sunbeams to a more southern clime; perhaps even the excellence of Monte Somma wine may have something to do with the acclivity on which the vineyards are planted. To my vision, fruit trees planted on terraces, and rising one above the other in amphitheatrical form, appear beautiful; but this has become, I suppose, unfashionable, because it happens to be a gem from the antique. Now restlessness in search of something new, however absurd, is incessant. The ancients appear, in this respect, to have known what they were about; and I must frankly confess that, in my estimation, they acted wisely, and had the better of us, and that we are decidedly in the rear. To this cause I attribute the remarkable fertility of the land of Judea in former times. Its susceptibility is sufficiently apparent, and there still remain existing vestiges of this mode of cultivating the flanks of the valleys, on the sides of the diversified hills of Palestine, to a considerable altitude. It is still, however, very questionable, whether low walls, constructed of brick, or of stone and mortar, quite vertical, would succeed so well as the surface of a calcareous or sandy soil, at an angle, for example, of 45°. A sandy soil absorbs heat, and continues heated, because sand is an indiffereut radiator, and is, moreover, a non-conductor of caloric (heat); so that vines, &c. in contact with such a surface, would be more than compensated for the temperature they would lose through the medium of radiation; which would also be attenuated from the inclination of the plane.

At St. Mary's Isle, the seat of Earl Selkirk, near Kirkcudbright, I remember to have seen a beautiful illustration of my views, in the case of pear trees pinioned to trelliswork in such an inclined surface as I have described; and I have always understood that the crops of fruit, which these trees carried, were remarkable both for quantity and quality: indeed, it must be apparent that, under such conditions, spring frosts can have little or no influence, because these frosts are entirely connected with the principles of radiation, and have little or nothing to do with the temperature of the atmospheric medium. If the soil is not of a sandy consistence, in that case, I would employ a thin stratum of sand. I have in my little garden just such a surface, inclined and sandy, and have planted vines with an intention to train them on the surface, on a frame work, something like cucumbers or melons in a hot bed. The vine I am making my experiments with, is called Miller's black grape. I have already had ample proof that the healthy luxuriance of other tender plants does not suffer, and that frost has little or no effect on such an exposure.

For the purpose of maturing the fruit, I shall throw a veil of black gauze over the vines; and this will secure me the effects of a powerful absorption of the caloric rays of the sun's beams. Though the radiation from a black surface is proportional to its absorbent capacity, it will operate during the lengthened day (and at this period of the year the night is reduced to its minimum) in the maturation of the fruit, while the sandy surface is retentive, from its non-conductive character. If bunches of grapes on vines exposed *sub duo*, or

reared in the open air, be tied up in white bags, they will scarcely ripen, are small, and want flavor; but if other bunches on the same vine be confined in bags of black crape, the contrast is very striking, in the latter being fully ripe, large, and of a flavor equal to those cultivated on a foreign soil. This fact explains the principle on which I would veil my vines with sable weeds; further explanation would, therefore, be superfluous and unnecessary.

Respecting the Chinese method of propagating fruit trees, it is merely requisite to detach a strip, or narrow riband, of bark from the branch or limb which is to be separated. The Chinese apply to this a ball of earth mingled with clay, to impart greater consistency to it, and this is covered with moss, and secured by bandages formed of some pliant material; a small pan containing water, is suspended over it and serves to keep it moist. This method, as successfully pursued in this country, was first pointed out to me by Sir Lauchlan MacLean, of Sudbury. The Italians often adopt the plan; and I have seen a large orange tree, 14 feet high, loaded with growing fruit, thus separated from the aged parent stock, and exposed for sale in the market at Naples. I have witnessed the plan in full operation near the royal observatory in that city. One obvious advantage is, that no time is lost in the growth of the tree; nay, the very abstraction of the ring of bark from the branch rather expedites than otherwise the evolution of fruit. The Italians have improved on the rude plan of the Chinese, by enclosing in a tin case, the stem of the future independent tree; it is filled with earth, pressed down, and covered with moss, which is preserved moist in the way I have already described. This part of it I have improved, by suspending the tin vessel which contains the water on an adjoining branch above the ball, while a woollen thread, previously moist, forms a line of communication, and affords a constant regular supply, on the principle of the syphon, and the capillary attraction of the fibres of the thread. A lid prevents the loss by evaporation from the surface of the water confined in the vessel.

A linear incision in the bark above a bud, it has been stated, will convert that bud into a branch. Last season I tried several experiments of this kind on a fig, cutting out a narrow strip of bark, over the bud, in the form of an inverted V, and succeeded in producing branches in five out of seven instances. The want of success in these two, I suspect, arose from the imperfect separation of the lips of the bark, and insufficient depth of the incision. I am, sir, &c. J. MURRAY.

January 20th, 1833.

ADVANTAGE OF SHORT STAGES IN DRAWING HEAVY LOADS.

From the Quarterly Journal of Agriculture.

Mr. Stuart Menteath of Closeburn, proprietor of one of the richest coalfields in the island, both as to quantity and quality, has very successfully employed horse power to the drawing of heavy loads, by dividing the road into short stages. Before this expedient was resorted to, each horse could travel the distance of only 18 miles, and return with a load of 24 cwt. thrice a week; that is to say, the aggregate of the labor of each horse amounted to 3 tons 12 cwt. weekly. But by dividing that distance into four stages of $4\frac{1}{2}$ miles each, four horses can make three trips daily, and draw a load of 33 cwt. each trip, or very nearly 5 tons daily, or 30 tons weekly. Hence, according to this method, the aggregate of the labor of each horse amounts to above 7 tons weekly. Suppose 16 horses are employed, instead of making them travel 18 miles one day, and return with a load the following, the more advantageous plan is to arrange them in four divisions, and make each division travel only $4\frac{1}{2}$ miles in succession. Were this distance divided into six stages, the load might be proportionally increased, with less fatigue to the horses; for it will invariably be found, that the most profitable mode of applying the labor of horses is to vary their muscular action, and revive its tone by short and frequent intervals of repose.

THE COMMON FOWL AND PHEASANT.

From the Quarterly Journal of Agriculture.

In the autumn of 1826, a wanderer of the pheasant tribe made his appearance in a small valley of the Grampians, the first of his family who had ventured so far north in that particular district. For some time he was only occasionally observed, and the actual presence of this *rara avis* was disputed by many; wintery wants, however, brought him more frequently into notice; and, in due season, proofs still more unequivocal became rife. When the chicken broods came forth, and began to assume a shape and form, no small admiration was excited by certain stately, long-tailed, game-looking birds, standing forth amongst them, and continuing to grow in size and beauty, until all doubts of the stranger's interference with the rights of *chanticleer* effectually vanished. These hybrids partake largely of the pheasant character; and as they are of a goodly size and hardy constitution, a useful and agreeable variety for our poultry yards may be secured in a very simple and economical manner. A. F.

THE BEE.

From Jesse's Gleanings in Natural History.

I have some experiment hives which enable me very accurately to inspect the operations of my bees. From the construction of the hives, the combs are necessarily built between two panes of glass, so that on drawing the sliders, the two surfaces of a comb are exposed to view. In this way I am able to see almost every thing that is going forward.

When the queen bee has an inclination to deposit her eggs, she goes forth, accompanied by six or eight working bees as a guard, and whose stomachs are filled with honey. She is very deliberate in her motions, and seems to proceed with great caution. She first looks into a cell, and if she finds it perfectly empty, she draws up her long body, inserts her tail into the cell, and deposits an egg. In this way, she slowly proceeds till she has dropped ten or twelve eggs, when perhaps feeling exhausted, she is fed by one of the attendant bees, who have surrounded her the whole time. This is done by the bee ejecting the honey from its stomach into the mouth of the queen. When this has been done the bee goes away, and another takes its place. The operation of laying her eggs again goes on, and is succeeded by the

same mode of feeding—the attendant bees frequently touching the antennæ of the queen with their own. When the operation of laying the eggs is completed—and it generally occupies some time—the queen retires to that part of the hive which is most filled with bees. During her progress the surface of the comb is very little intruded upon, and the space seems purposely to be left unoccupied. Some few of the cells, however, in a brood comb, are passed over by the queen, and are afterwards filled either with honey or farina. These serve as deposits of food, from which the neighboring brood may be fed more readily, as such cells are never covered with wax.

With the hives referred to, I have been able to follow many of Huber's experiments, and can bear witness to his general accuracy, except in regard to the fecundation of the queen bee. I have bestowed much time and pains in endeavoring to discover any of the circumstances he mentions relating to this fact, but without success. Neither have I ever seen a cell visited by one of the drones *after* the egg had been deposited, which a modern writer has asserted they do. I have for many years watched my hives with the greatest care and assiduity, but have never yet seen the queen bee leave the hive, except at the time of swarming. I have also spoken to several experienced bee masters on the subject, and they are of the same opinion with myself—that she never quits it. Her person is so easily distinguished from the other bees, by any one at all conversant with them, that if the queen absented herself from the hive, in the way Huber describes her as doing, it seems next to impossible that she should not have been perceived, either on her departure from, or on her return to, the hive. And yet we have no English writer on bees (and we have many acute and observant ones,) who has even hinted at the probability of the queen's leaving the hive in the manner Huber asserts that she does. It is now many years since his work was published, and no part of it is more curious or more satisfactory, if correct, than what he says on the impregnation of the queen bee. Curiosity has in consequence been much excited, and many persons, like myself, have been anxious to ascertain the accuracy of his statements. It does not appear, however, that any one in this country has succeeded in doing this, though we have many very patient observers. Is it probable therefore, that it should have been reserved for Huber alone to ascertain a fact which had escaped the notice of naturalists, not only for ages before, but, what is more important, for years since the publication of it in his work? It should be recollected also that Huber was blind, or nearly so, and that he was obliged to rely very much on the reports made to him by his assistant, Burnens. It is however with considerable diffidence that one would venture to doubt the accuracy of any statement of Huber's, especially when the objection turns, not upon a contradictory circumstance, but upon what myself and others *have not been able to discover.*

Wax is a secretion formed under the scales of the back of the insect, from which I have repeatedly seen it exfoliate in small flakes. A considerable degree of heat appears to be necessary to produce this secretion, as I have always observed it most frequent in hot weather. Other writers have maintained that the wax is discharged from the abdominal rings or segments of the bees. This may be also the case, but I have never perceived it.

The vision of bees seems very imperfect. I have frequently turned a hive, so as to make the entrance about two or three inches from its former position, and have then always found the bees at a loss to gain admittance. Indeed they seem more to *feel* their way than to see it, after they have once landed themselves on the board of their hives. Their progress through the air is always made in a direct line to the hive, and the instinct which enables them to find it, amongst forty or fifty others placed in a row, and nearly similar to each other, is very striking.

Mr. Rogers, in his "Pleasures of Memory," has a pretty idea on this subject;—

"The varied scents that charm'd her as she flew,"

he thinks might point out the way of her return to the hive.

Wasps appear to have a better vision than bees, though it is not easy to assign a reason for this being the case, since the construction of the eyes of both insects seems to be similar. Derham, in his Physico-theology, has observed, in regard to the eye of the bee and wasp, "that the cornea and optic nerves being always at one and the same distance, are fitted only to see distant objects, and not such as are very nigh, and that the eye will be found, on examination, to form a curious lattice-work of several thousand hexagonal lenses, each having a separate optic nerve ministering to it, and, therefore, to be considered as a distinct eye." Wasps, however, certainly seem to alight at the entrance of their nests with more accuracy than bees. I have frequently observed this to be the case, even when the hole of a wasp's nest has been in a grass field, surrounded with long grass. They alight at it with the greatest precision, seldom or never going even half an inch either on one side or the other of it, and they do this even late in the evening.

A hive of bees which have been once much exasperated, do not soon forget the injury. This was the case with one of my hives, the bees of which never allowed me for two years to come near them while they were working, without attacking me, though a neighboring hive would allow me to take almost any liberties with it with impunity. Indeed I had familiarized myself so much with some of my bees, that I am convinced they knew me, and they always appeared to distinguish me from strangers. By constantly standing before the mouth of the hive, and allowing vast numbers to fly about and settle upon me, and by frequently feeding them, they became so well acquainted with me, that I had much pleasure in witnessing their attachment, and the confidence they placed in me. This affection was mutual, and I always think with pleasure of the many agreeable hours I have passed in company with my bees. Those only can judge of this, who like myself, have witnessed their assiduity, their internal labors, their affection for their queen, and all the various modes they take in promoting the prosperity of the community. I always listen to the pleasing hum of bees with delight, and know of few sounds more soothing and agreeable.

"Then, cheerful bee, come, freely come,
And travel round my woodbine bower!
Delight me with thy wandering hum,
And rouse me from my musing hour;
Oh! try no more those tedious fields,
Come taste the sweets my garden yields:
The treasures of each blooming mine,
The bud—the blossom—all are thine."

In some papers published a few years ago in the "Plain Englishman," I endeavored to point out the great cruelty of procuring honey by the suffocation of bees, and the advantage which the bee owner would derive from contenting himself with a part only of their stores. This may be done by placing a small hive glass, or even a flower pot, on the top of each hive in April or May. These should be of a size to hold about eight or ten pounds' weight of honey; and in a tolerably good season they will generally be filled, leaving a sufficient stock of honey for the bees to subsist upon till the following spring. I am happy to find that this method is more generally practised than it formerly was. By adopting it, the lives of thousands of these industrious insects would be saved; the profits of the bee owner would be much more considerable, and his stock of bees annually increased.

The summer of the year 1818, I observed before, was unusually dry and hot, and in July, flowers of almost every description had entirely disappeared. I observed that bees, in consequence of this, seldom left their hives in search of honey, though the weather, one would have thought, would have tempted them out. They seemed, indeed, to be perfectly aware that their labors would be useless. I recollect meeting with an account of a hive of bees being transported from a distant place, to a spot by the side of a mountain in Italy, where they could procure honey all the year round. Finding this to be the case, they soon gave up stocking their hive, and only went out to collect honey as they wanted it. The same observation has been made on bees taken out from this country to the West Indies, who the first year stored their hive as usual, and never afterwards, merely supplying themselves with food from day to day.

* * * * * *

Nothing can be more extraordinary than the way in which bees find their way back to their hive. Place it amongst hundreds of others, exactly similar in outward appearance, or at the top of a house in London,* or concealed in the thickest wood, and the bee will regain it without the slightest apparent difficulty. Huber says they fly to it with an extreme rapidity, and as straight as a ball from a musket. Nothing can show more forcibly the wonderful instinct which has been given to these insects, by Almighty God. If they experienced any difficulty in finding their homes, how much time would be lost, and how inadequate would all their labors and industry be, to furnish a sufficient store of honey to exist upon during the winter! I have always observed that when a fresh hive has been brought to my garden from a distant place, the bees employ themselves on first leaving it, not in collecting honey, but in making themselves acquainted with all the neighboring objects, and these objects may possibly serve to guide them to their respective homes.

*I was shown a fine glass of honey taken from a hive of bees placed on the top of a house in Harley street.

WINTER FOOD OF BIRDS.

From Jesse's Gleanings in Natural History.

"Birds are extremely important creatures for the economy of nature in general. They destroy innumerable insects, and the thoughtless extirpation of some birds, supposed to be noxious, such as sparrows, crows, &c. has generally given rise to an infinitely more prejudicial multiplication of vermin."—*Blumenbach.*

It is a general observation of the country people, that when there is an unusual number of hawthorn and holly berries, there will be a hard winter. The remark is perhaps more true than is generaly supposed, and may be considered as a proof of the care which is taken by an Almighty Power of its creatures. How many birds would perish during a severe winter if this provision had not been made for them! Even the circumstance of some springs not freezing, is an instance of the same goodness. If they did, the destruction of animal life would be much greater than it now is. At present many birds are able in hard weather to find water and food. The robin, thrush, and blackbird, with woodcocks and snipes, resort to these springs, and are able to support life with the worms and insects they find in or by the side of them, till more genial weather arrives. In deep snow many birds frequent woods, where, amongst old dead or decayed trees, and the bark of others, they discover and feed upon insects. Horses and deer scrape away the snow with their feet to get at the grass, and hares and rabbits feed on the bark of trees. The titmouse in frosty weather gets near houses and picks meat from bones. The hedge-sparrow and wren search at the bottoms of hedges, where the snow has not penetrated, for insects. The wood-pigeon feeds on the tops of turnips, while sparrows, finches, yellowhammers, &c. get into rick yards to satisfy their hunger. Most birds therefore are able to procure some sort of sustenance during a hard winter; and some animals remain during that period in a state of torpor, from which the influence of the sun in spring revives them. Insects appear but little affected by cold weather, as we may see on the first mild day after the severest frosts. Bees survive the coldest winters in Russia, and afterwards lay up much store of honey.

We thus see that, however miserable the condition of birds in severe weather may appear to a cursory observer, they have resources provided for them in various ways. The same beneficent Being who created them, provided at the same time means for their subsistence. It is man who occasions the chief miseries of the creatures which surround him. When, however, we consider that these creatures are the objects of God's care, how careful ought we to be never to inflict any unnecessary pain or misery upon them. I should not think kindly of that man who could wantonly put his foot on a worm which was crossing his path, or destroy a fly for the gratification of doing so.

EXTRACTS FROM PRIVATE CORRESPONDENCE.

SUGGESTIONS OF THE USE OF MINERAL WATERS FOR IRRIGATION.

* * * I cannot but flatter myself that my investigation of the mineral waters of the country will result in good, even to the *agricultural* community. The benefits derived by agriculturists from the irrigation and inundation of their lands, have been ably and amply detailed in works on agriculture. There are valuable communications on these subjects in some of the early numbers of the American Farmer; but I do not remember to have seen any thing on the subject of irrigating or inundating fields with water *impregnated with mineral substances.* This is a subject that I am inclined to believe will, at some future day, attract no inconsiderable attention. Our country, *cis* and *trans*-montane, abound with springs, that are more or less impregnated with earthy or mineral substances, which exert a very material influence on vegetation. In some cases, this mineral impregnation proves destructive to vegetation. I have seen a strip of land entirely denuded, by the effects of water that flowed from the base of a ledge of rocks which abounded with pyrites of copper. In other instances, the mineral impregnation conduces as evidently to *vegetable*, as to *animal* life. I remember to have seen two springs, situated in an alluvial soil, about one hundred yards apart—the one highly charged with lime—the other was a spring of common water. The vegetation along the flat through which the water, with a mineral impregnation, flowed, was much more luxuriant than the vegetation along the flat through which the common water passed. As in both instances the soil was similar, and as both flats had, from time immemorial, been subjected to like culture, it would be difficult to account for the difference in the vegetation, in any other way, than by attributing it to the different properties of the water in the two fountains. With but a moderate expenditure of labor, the water from either of these springs might have been carried over some fifty or sixty acres of land. * * *

GYPSEOUS DEPOSITES, &c.

Prince Edward, Feb. 14.

* * * I believe there can be no doubt of the existence of a considerable bed of gypseous earth, or rather mud, on my land. I have, to day, ascertained that selenite may be found in seams, in the clay, for about forty yards, on both sides of the ditch which I before mentioned to you. The body of clay containing it, is from one to two feet in thickness, and about three feet below the surface. What, I believe, the mineralogists would call its *gangue*, (or accompaniments,) consists of dead coal, coal slate, sand stone, and a variety of other secondary rocks, all considerably impregnated with lime. There are among it numerous streaks of clay, of a *blue black* color. The clay is much disposed to crack in dry weather, and I judge that the seams of selenite have been made by a filling up of fissures thus formed. If this be the case, I shall probably not find them, after digging beyond the reach of the atmosphere into the bank. The clay intervening between these seams has a white efflorescence on it, on drying, in some states of the atmosphere. The bed lies near the principal locality of salt on my land. The calcareous accompaniments, and the vicinity of salt, (a compound of sulphate of magnesia and muriate of soda,) have suggested the thought that an artificial compound might be formed, possessing most of the ingredients (if not in the same proportions) of the *cendres de mer.* By the way, may it not be possible, that the chief cause of activity in this far famed manure, is the circumstance, that it contains about lime enough to neutralize the constantly forming vegetable acid, and thus leaves the gypsum at full liberty to do its office? Or, perhaps, a total *nullification* of acid is not desirable, as we find, that in countries containing highly calcareous soils, gypsum has not obtained much reputation as a manure. I am clear for *nullifying* a little, and with that view, have offered eight cents a bushel for common ashes, three or four miles from home. As yet, I have been able to purchase but twenty bushels. Have you observed, that excess in marling operated as a drawback on the activity of gypsum? A full development of the *modus operandi* of mineral manures, would very much expedite the grand benefits which they are most probably destined to bestow on agriculture.

I shall make but small experiments with my gypseous clay on any but marled lands, lest I exhaust the bed uselessly. It is unfortunately more than half a mile from my little spot of marled ground, which is now in wheat, and recently sown in clover. Great encouragement is given, in an excellent article, by "A Subscriber," in your first number, for using it after marl. There is, however, so much calcareous matter in the rocks about it, that I think I might, at least for a small experiment, safely mix them together and spread them in some clover about six hundred yards from the bed. If I do not misunderstand the theory of this matter, gypsum may more fearlessly be trusted with but little lime on poor land than on rich; unless the want of fertility is produced by an accumulation of acidity.

In a letter in your 8th No. I mentioned, that a gentleman about ten miles to the west of this stripe of secondary formation, had found marl. I have just learned from young Mr. Dame, who analyzed it, that it was not marl, but selenite mixed with sand. He was informed that there was a vast quantity of it. The land on which it is found, belongs to Nicholas Edmunds, Esq. near the head of Little Roanoke Creek in Charlotte. I would judge, that of course, there must be lime in some other form, wherever selenite is found. Yet that quarter of the country has usually been considered of primary formation. There seems to be much in Virginia to confound the notions of the *world makers.* Mr. Edmunds lives in the course of the hornblende range, though I never was on his farm.

CASTOR BEAN, AND OIL.

* * * When you find leisure to write again, I would thank you to inform me the probable cost of a machine for hulling or shelling the castor bean—what, I suppose, the Scotch would call a *hummelling* machine. The plant grows with amazing vigor, on my land. I do not know that I shall ever cultivate it; but I sometimes think of it. There is so much leaf and stalk in proportion to the crop gathered, that it must be an improver. The cake, made of its bean, is certainly a wonder-

ful manure. Perhaps it may not be necessary, in making the cold pressed oil, to take off the shell. It was considered entirely necessary, I believe, when the oil was made by boiling, as the shell is said to be a powerful and dangerous emetic.

[The hulling of the castor beans is not required in the preparation of the cold-pressed oil. Dr. T. G. Peachy of Williamsburg, who carries on this business, makes use of a powerful hydraulic press, which performs its required purpose admirably.]

MARL ON NOTTOWAY RIVER.

Railroad, Southampton, Va.
Feb. 16th, 1834.

With this letter you will receive a specimen of marl, which I obtained near this place a week or two ago. I found it on the bank of the Nottoway, near Savage's farm. The river there makes a bend; the bank where the marl lies is twenty five or thirty feet high—the lower part, say ten feet, composed wholly of marl, of which I send you a fair specimen. The proprietor of the land told us, that this bed of marl ran a quarter of a mile along the bank, and then continued across his farm, to what distance he knew not—the breadth of the deposite on his lands being perhaps one hundred yards. I should not have cared to send you a sample of what has become so stale with you, but for the singularly fine position of this immense bed of shells—to wit, on the perpendicular bank of a navigable river—for a quarter of a mile, and probably more, perfectly convenient for batteaux—and within about one mile of the line of the rail road. The proprietor has lately bought the place, and proposes to apply the marl to his land. I hear of several other deposites of marl on the line of the road.

During the last month I have had the pleasure of wading near half the time in swamps—frequently while frozen over. However, it was no great matter, when my boots had holes enough in them to draw off the water. * * *

[The marl described above is important on account of its richness, as well as for its convenient location. The specimen contained 52 per cent. of carbonate of lime.]

GELATINE.

At present there is a dispute among the chemists of Paris, whether this substance, which has hitherto been considered extremely nutritious, possesses any alimentary powers whatever. At a late sitting of the Academy of Sciences, a M. Gannal announced that he had, during seventy days, made experiments on gelatine, considered as an alimentary substance, and he concluded that it possessed no alimentary qualities whatever. He challenged the advocates of a contrary opinion to submit with him to a regime, which would have for its object to decide the important question. The Journal des Debats, with a due regard to the health and valuable lives of the Academicians, says it does not believe that the challenge of M. Gannal will induce many of the Academicians to accept it, implying that so important a question should not be decided by putting the healthy state of these respectable men's statements into jeopardy.—[*Nat. Gaz.*

MOWING MACHINE.

From Address of Henry Colman to Hampshire Agric. Society.

A mowing machine moved by horse power, and producing a great saving of manual labor has been for two or three years in successful operation in Pennsylvania, and the western parts of New York; and from the testimony of one of the largest farmers in the United States, upon whose farm it has been two years in use, is highly successful. We cannot imagine what human skill and enterprize may yet effect. Professor Rafinesque, of Philadelphia, a gentleman of distinguished scientific attainments, advertises for farmers, his "steam-ploughs, by which six furrows are ploughed at once; and he promises in one day to perform the work of a week in the best manner." Of their construction or operation I have no idea.

ON THE USE OF PROVINCIAL, OR IMPROPER TERMS, IN AGRICULTURAL PUBLICATIONS.

The complaint made by F. G. A. (in the earlier pages of this No.) of his perplexity caused by the use of strange names for implements, may be justly applied to almost every branch of agricultural practice. Every district, indeed almost every neighborhood, has some peculiar terms in common use, or, (what is worse,) some peculiar application of a term generally known with different signification. Under these circumstances, it is scarcely possible for a writer on agriculture to be always intelligible, as he is not only compelled to use terms which are not correct, or in general use, but he is also liable to be misunderstood when his terms are proper, because they are improperly applied by readers. But great as may be this evil in the United States, it is far worse in England. Marshall has appended to several of his county surveys vocabularies formed of the provincial farming terms in use in the counties described: and though his several lists, with the definitions, would fill more than half of one of his octavo volumes, yet he has not explained all the terms which he himself has used. Good English scholars, for want of acquaintance with provincialisms, could not understand the meaning of many passages in the works of the best agricultural authors. The same objection applies, doubtless, with more or less force, to the agricultural books of every country—and hence the great and peculiar difficulties of making correct translations from foreign languages, of articles on agriculture.

As a specimen of description rendered unintelligible by the use of provincial terms, the following passage is presented entire, from one of the best informed, and voluminous English writers, and who had travelled more, and was better acquainted with the general practices and various language of farmers, than any other person whatsoever. The author is Arthur Young, and the work quoted from, the *Survey of Norfolk*, drawn up, and published, by order of the *Board of Agriculture.*

"Mr. Margateson, of North Walsham, breaks up the ollands of the second year, by riffling before harvest; he harrows down, and ploughs as fleet as he can; after that, a full pitch for dibbling; he is clear that this is the best way for wheat, but as certainly a loss in the barley crop; for the previous tillage he has brought the flag into such a state, that the wheat exhausts far more of the benefit, than when set on a whole furrow.

"In general, they riffle the second year's lay before

harvest at Westwick, &c. for dibbling; but some on one furrow; and many this year; the dry weather having prevented some breaking the lays."

The evil complained of cannot be entirely avoided, until there is something like an agricultural nomenclature adopted. There are very many things necessary to refer to, when writing on farming, for which no names are to be found in dictionaries; and for these, technical, or provincial terms can only be used. The exchange of the views of distant farmers, through the channel of agricultural journals, will do much good in this respect, by extending the use of such terms as are already most general, or are most correct, and restraining the use, or limiting the application, of others.

There are other means by which the correspondents of the Farmers' Register may aid in removing these hindrances to the diffusion of information, and which will be submitted to their consideration. It is desirable to collect, and have defined, all the provincial terms which are in sufficiently extended use, to deserve such notice. Every one is able to offer some of these terms correctly defined, with their locality stated, and accompanied by a responsible name as authority, to prevent deception. These might be published from time to time, and would serve two useful purposes, viz. by directing the avoidance of all such terms, whenever others of more general and correct use could be sustituted—and by presenting the meaning of those which cannot be well substituted.

As to the confusion arising from improper, or uncommon names being applied to ploughs and other implements, there may be used an additional means of prevention, and which will be productive of other important benefits. It is desirable to give correct and well executed wood engravings of all new implements, and even such old ones as are valuable, and not generally known. The figures should be accompanied with a concise, but plain description of each implement or machine, and a statement of its peculiar uses, operation and price. If the makers of implements will furnish the necessary engravings and descriptions, they will be published in the Farmers' Register, without additional cost; and such publications on a regular and proper plan, would serve as the best advertisements, both for the sellers and buyers. It would, however, be required that the drawing should be correct, and the engraving executed in the best style; as otherwise, the figures would be neither ornamental to the work which would give them place, nor useful to farmers and purchasers.

FARINACEOUS ALIMENT OBTAINED FROM STRAW.

From the Quarterly Journal of Agriculture.

The attention of agriculturists in France has been recently directed to the discovery of a method of converting straw into a kind of bran, or *farine*, for the feeding of domestic animals. This discovery has been claimed by two individuals: the first is a miller near Dijon, of whose name we are not informed, who, it is said, on trying the millstone of a new mill, discovered the possibility of converting straw into nourishing food; the second is M. Joseph Maitre, founder of the fine agricultural establishment of Vilotte, near Chatillon. This distinguished agriculturist, known for the purity and perfection of his breeds of sheep, conceived the idea of converting into farine, not only the straw of wheat and other grains, but of hay, trefoil, lucern, santfoin, &c. His efforts are said to have been perfectly successful, and his discovery arrived at, not by chance, but by long experiment and research. The aliment which he has produced, is said to be a complete substitute for bran. It is given to sheep and lambs, who consume it with avidity, and may be given to all other graminivorous animals as a grateful and substantial food. M. Maitre, with the view of bringing the process to perfection, has ordered a mill for its manufacture to be erected in the midst of his large farms: and he is preparing to communicate a report to the Royal Society of Agriculture, on the advantages in rural and domestic economy to be derived from this preparation. We are not, at the present moment, informed of the nature of this process. If it be a simple grinding of the straw, or fodder, and a separation of some of its fibrous matter, we can easily imagine the advantages that may result from it. We know in this country, that the mere chopping of straw adds greatly to its powers, by facilitating mastication and digestion. We may believe that a more perfect comminution of its parts, will produce a corresponding effect, and extend very widely the uses of straw and other fodder, as a means of feeding our domestic animals.

NATURE OF EARTHS WITH REFERENCE TO THE GROWTH OF PLANTS.

From the Revue Encyclopedique.

The Report of MM. Thenard and Sylvester, on a memoir upon this subject by M. J. St. Hilaire, is to the following purport. The author remarks that most persons who have analyzed arable earths, [soils,] have taken exclusively such as had been cultivated, and in which the original constitution had been more or less altered. He believes that the various kinds of earths in their first state have peculiar powers, of nourishing particular plants; and thinks that the exact knowledge of these peculiarities would enable cultivators to put those seeds in the ground which are most suited to it. From various analyses, he draws the following inferences:—1st, That all earths are composed of silica, alumina, lime, lime, magnesia, &c. in different proportions, together with a vegeto-animal matter, which is more abundant as the earth is more fitted for the nourishment of plants; 2dly, That plants placed in earths, of which the constituent parts have an analogy with the particular nature of the plants, do not exhaust the soil; 3dly, That a series of observations on the different species, genera, and families, which grow naturally and in great numbers, perpetuating themselves on certain soils, with the analyses of these soils, would be of great utility in agriculture. The reporters think that agriculture would draw from such labors general inductions, rather than positive directions, but still that these would possess great interest.

MONTHLY COMMERCIAL REPORT.

To the Editor of the Farmers' Register.

Sir,—To give you a commercial article at this time, is almost the same as to write about a non-entity.

The commerce of Virginia and of the states north of her, is at this moment limited chiefly to the small business which must at all times exist—that of supplying the demand for articles of neces-

Diary of the Weather at Fort Monroe, Old Point Comfort, for March 1834—37° *N. Lat.*

Month	Thermometer.			Winds	Weather	REMARKS.
March	VII. A. M.	II. P. M.	IX. P. M			
1st	45	56	47	S. W.	Clear.	
2d	43	49	44	W.	"	
3d	31	40	38	N.	"	
4th	37	51	46	S. W.	"	
5th	43	56	54	S.	Cloudy.	
6th	53	59	56	S. E.	Clear.	
7th	47	60	55	"	"	
8th	61	68	61	S. W.	"	
9th	48	46	44	N. E.	Cloudy.	
10th	44	50	46	S. E.	"	
11th	47	55	50	N. E.	Rain.	
12th	48	64	57	N. W.	Clear.	
13th	48	50	45	S.	"	
14th	42	62	53	"	Cloudy.	
15th	46	45	44	N.	"	
16th	43	48	42	"	Clear.	
17th	39	52	48	N. E.	"	
18th	47	57	52	S. E	"	
19th	56	63	62	S.	"	
20th	58	64	65	"	"	
21st	56	56	41	N.	"	
22d	32	44	39	"	"	
23d	39	56	54	S.	Cloudy.	
24th	53	57	52	S. E.	"	
25th	53	68	59	N. E.	"	
26th	45	49	45	N.	Clear.	
27th	44	48	44	N. E.	"	
28th	48	57	51	"	Rain.	
29th	50	60	56	"	Cloudy.	
30th	37	46	41	N. W.	Clear.	
31st	41	50	45	N. E.	Cloudy.	

*Diary of the temperature and state of the Weather in March, observed at Shellbanks, Prince George County—*37° 14′ *N. Lat*

Fair, or sunshine, f—*cloudy,* c—*rain,* r.

MARCH.	Thermometer at Sunrise.	Weather.	2 o'clock, P. M.	Weather.	Twilight.	Weather.	Change of weather during the night.
1st	34°	c	55°	f	50°	f	
2d	56	c	59	f	55	c	
3d	28	f	35	f	36	f	
4th	30	f	54	f	52	f	
5th	40	c	61	c	59	c	rain.
6th	52	c	67	f	64	f	
7th	56	f	70	f	61	f	
8th	64	c	74	c	73	f	
9th	45	f		f	44	f	
10th	33	c	44	f	42	f	rain.
11th	41	r	50	r	51	c	
12th	45	c	65	f	61	f	
13th	40	f	55	f	50	f	
14th	35	c	62	f	53	r	
15th	42	c	48	c	47	f	
16th	57	c	49	c	46	c	
17th	31	f	60	f	55	f	
18th	44	f	66	f	60	f	
19th	54	f	72	c	69	c	
20th	60	c	72	f	70	f	
21st	59	f	53	f	54	f	
22d	30	f			40	f	
23d	28	f	57	f	55	f	
24th	51	r	60	c	54	f	
25th	49	c	75	f	59	r	
26th	40	c	50	f	46	f	
27th	35	c		f	45	f	
28th	41	c		r	51	c	
29th	48	c	45	f	64	c	
30th		f	46	f	36	c	
31st		f		f	49	c	

sity, and of daily consumption, and the sale of so much of the produce of the country as will pay for those articles, in whole or in part. The activity and expansion heretofore so evident in all branches of industry, can no longer be perceived.

Our exporting merchants can engage in no large operations. Those whose funds are abroad, cannot at the moment convert them into money at home, unless at so heavy a sacrifice by the sale of bills of exchange, as the temptation of a large profit would alone induce; and consequently, if they purchase our produce, it must be at low prices. On the other hand, the planter, or farmer, is equally unwilling to be the party to make the sacrifice, and of course an unusually small portion of business is transacted.

Another class of merchants, whose funds are scattered among their customers at home, cannot make collections, because the price of produce is low; or if they have large stocks of goods on hand, the diminished demand equally deprives them of the usual means to meet their engagements.

The commercial system, and consequently the agricultural and the manufacturing, are heavily depressed. Prudence induces some, and necessity compels many, to suspend their usual operations. The moving power of capital is wanted, and all parts dependant on it, are necessarily idle. Poverty and want ensue, and these prevail to a great extent in those communities which heretofore have exhibited the greatest industry. It is not the rich who suffer most, under such circumstances. The wealthy man, engaged in active business may (if compelled to remain idle,) see his capital diminish; but the poor man, who from the same cause is deprived of employment, must feel extreme privation.

With a tariff modified to comparatively moderate duties, such is the pressure on many of the merchants, that they have ceased to import; and others, to whom goods were shipped on consignment, have in several instances returned them, rather than pay the duties, and incur the risk of bad debts on their sales. The treble effect of this is—first, to reduce the revenue; secondly, to deprive us of the usual supply of useful commodities, (these acting more powerfully than a high tariff—indeed, equal to a prohibitory one;) and thirdly, to diminish the demand for our own produce, which would of course be shipped, to pay for importations from abroad.

Our millers have large quantities of flour on hand, which cannot be sold unless at ruinous prices. It is true that the unprecedented low price of $3 75 to $4 50 per barrel, induced some merchants to speculate in New York, and caused a small advance.

Tobacco sells at $3 to $7. Cotton at 10½ to

11½ cents. The state of foreign markets would in ordinary times, cause these articles to be from 10 to 20 per cent. higher, exclusive of the home demand, which has been greatly diminished by the closing of manufactories. Stocks in our State Banks, which have been a favorite investment for many years past, and were a few months ago worth $114, were recently sold below par.

A recent operation will show the state of our commercial relations, and the contrast they exhibit to those of England. A loan to the state of Pennsylvania, bearing five per cent. interest, was contracted for within the last eighteen months, by American capitalists, at a premium of 13½ per cent. Instalments, to the amount of some millions were punctually paid, but the subversion of the money concerns of the country, deprived the contractors of the usual means of negotiation, and the last instalment remained unpaid. It was advertised for sale, and not sold for some time. At the same moment, money in England was so plentiful, that the East India company loaned to a noted capitalist, a sum equal to ten millions of dollars, at an interest of 2½ per cent. per annum. He could purchase dollars, and ship them to this country, to cost about ninety-two cents. He became the purchaser of the forfeited portion of the Pennsylvania loan, at one-fourth of one per cent. above par—thus receiving $5 per annum, for the use of $92 25, while he is paying $2½ per annum, for the use of $100. The state of Pennsylvania or one of her citizens, thus loses, while a foreigner steps in and makes the profit. The currency of the one country is deranged: the currency of the other, is in its regular course. This proves the assertion, that our public credit will be controlled by foreign capitalists. Indeed, at this time, the profits of our commerce are to a great extent, thrown into the hands of foreigners, whose capital unembarrassed by a sudden change, is employed on terms prescribed by themselves, free from the usual corruption of our own merchants, in the purchase either of our produce or our stocks.

It is supposed by some, that the abstraction of a few millions of capital, being but a small proportion of the wealth of a country, can have but little influence upon its general commercial operations. This idea is incorrect: the whole amount of money in circulation, in any community, bears but a small proportion to its capital. The rapidity of the circulation, enables it to represent successively, the value of innumerable commodities. One hundred dollars is paid by a miller to a farmer for his wheat—this money does not remain in the farmer's hands, but is used to pay some debt, or for some article of necessity or luxury. The persons to whom it is paid, apply it in like manner, to meet their engagements, so that it is incessantly passing from hand to hand, and may be used in one week, or even in one day, to pay debts amounting in the aggregate, to a thousand dollars. The miller converts his wheat into flour; the money he obtains for it continues in active circulation, as does that which the baker receives for his bread. Let us suppose the miller keeps his $100 in his pocket: abstract this small sum from active circulation and innumerable transactions, contributing to the comfort and support of many individuals, are suddenly suspended.

But as capital will find its way to those places where it can be most profitably employed, it is fair to presume that the pressure now existing, will be gradually relieved by the introduction of capital from abroad, as in the case of Pennsylvania, and as is about to be attempted in the state of New York, where it is proposed to sell six millions of state stock, and to furnish to the banks, the money thus obtained, which will enable them to sustain their own credit, and increase the loans to their customers.

X.

April 10, 1834.

CHANGE OF EDITOR'S ADDRESS.

The name of the post office heretofore called Garysville, has been changed, by order of the Post Master General, to *Shellbanks*. Correspondents will please to make that alteration in the direction of letters, &c. for the Farmers' Register.

ACKNOWLEDGMENT OF COMMUNICATIONS.

On Draining (continuation from No. 7)—On Culture and Preservation of Potatoes—On Hill Side Ditches—On Draining, by a Charlotte Man—On Hessian Fly—On Embanked Marshes and Malaria—Answer to Queries on Tobacco—On Irrigation—Farming in Northampton County, Va.

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ERRATA IN NO. II.

The first article in this No. (by J. F. Edmunds,) should have been dated from Charlotte County, instead of Mecklenburg.

The title "Tobacco" on page 670, should have been "Improvement of the Navigation of the Upper Appomatox."